A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY

May 13, 1954

NTS PAGE 2

You get the benefits of expensive metals...

ithout their high costs when you use Thomas pre-coated strip teel in the manufacture of your products. It is available oated with copper (as shown above emerging from one of Thomas' electroplating units) also zinc, brass, nickel, lacquer, in, or lead alloy in either planished or buffed finishes. A Thomas sales engineer will be glad to study your fabricating rocesses and make a proposal that could save you time and oney and enable you to make more salable products. Call r write today!

Thomas Strip®

COLD ROLLED STRIP STEEL

Thomas Strip Division

Pittsburgh Steel Company • Warren, Ohio

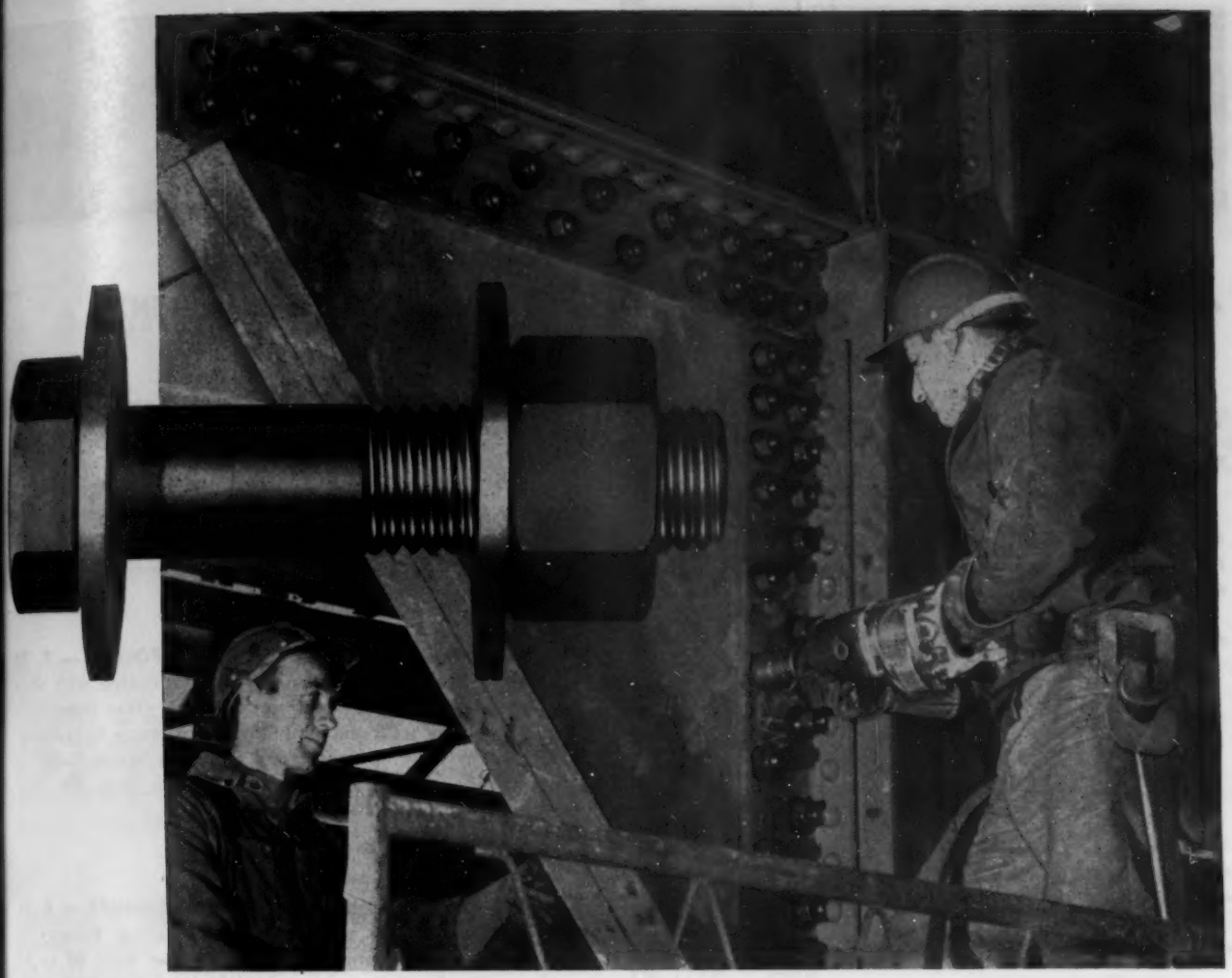
COOLING AND SIZING OF DENSE REFRACTORY GRANULES—OHIO WORKS

GRANULAR BASIC

REFRACTORIES

Only through extensive, modern production facilities and by continued product development can we furnish the steel industry with a dependable supply of granular basic refractories—premium products at competitive prices.

BASIC REFRACTORIES INCORPORATED CLEVELAND 15 OHIO



JOBS GO UP FAST *with* HIGH-STRENGTH BOLTS

Steel erection moves along faster when you join structural members with Bethlehem High-Strength Bolts, instead of field-driven rivets.

Bethlehem High-Strength Bolts save erection time because they can be installed by two men using a holding wrench and a pneumatic impact wrench. The hexagonal-head bolts are used with two hardened washers, one placed under the head, the other under the hexagonal nut. Tightening can be accomplished in from 5 to 10 seconds per bolt, to obtain maximum clamping force.

Bethlehem High-Strength Bolts are made of carbon steel, in diameters from ½ in. to 1¼ in., and in varying lengths. They are heat-treated by quenching and tempering to meet the requirements of ASTM Spec. A-325.

For full information about how Bethlehem High-Strength Bolts can help speed your construction work, get in touch with the nearest Bethlehem sales office.

MECHANICAL PROPERTIES OF BETHLEHEM HIGH-STRENGTH BOLTS

Bolt Diameter	¾ in.	⅞ in. and 1 in.
Brinell Hardness	241 to 302	235 to 302
Min. Tensile Strength, psi	120,000	115,000
Min. Proof Load, psi	85,000	78,000

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

The Iron Age

Vol. 173, No. 19, May 13, 1954

★Starred items are digested at the right.

EDITORIAL

What Price Bellwether? 7

NEWS OF INDUSTRY

★Special Report: Warehouses in Triple Fight 71
Marketing: U. S. Steel Revises Stainless Prices .. 73
★Big Risk in New Inventions 74
★Management: Replacement Needs Overall Plan 75
★Labor: Steelworkers Map New Wage Policy .. 77
★Transportation: Set Summer Seaway Start 79
Research: "Mill" Aluminum Chemically 81
★Trade: Seek Steel Export Freight Rate Cut 83
Industrial Briefs 92
Personnel: Iron Age Salutes 109
Iron Age Introduces 111
Clearing House 200

NEWS ANALYSIS

Newsfront 69
★Report to Management 91
★Automotive Assembly Line 94
★This Week in Washington 99
West Coast Report 102A
★Machine Tool High Spots 103A

TECHNICAL ARTICLES

★Ultrasonic Testing Lowers Forging Costs 117
★Better Properties Extend Porcelain Enamel Use . 121
Semiautomatic Tumbling Increases Output ... 125
★Titanium Successfully Hot Extruded 126
★ASTE: New Tooling Ideas 130
★Free Fall Quench Cuts Heat Treating Costs .. 134
Technical Briefs 146

MARKETS & PRICES

★The Iron Age Summary—Steel Outlook 179
Market Briefs 181
★Nonferrous Markets 182
Iron and Steel Scrap Markets 186
Comparison of Prices 190
Steel Prices 192

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Publications 136
New Equipment 165

INDEX OF ADVERTISERS 208

Copyright 1954, by Chilton Co. (Inc.)

THE IRON AGE, published every Thursday by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $5 for 1 year, $8 for 2 years in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage." N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

DIGEST of t

NEWS DEVELOPMENTS

REPLACEMENT NEEDS ALL-AROUND PLANNING — P. 75
Expanding economy plus higher wage rates demand more productivity. This means greater pressure for the replacement of plants and machinery. Faster depreciation, closer control, streamlined record keeping, education of employees are discussed by American Management Assn. conferees.

STEELWORKERS MAP NEGOTIATION POLICY — P. 77
United Steelworkers of America, confronted with wide unemployment and short work weeks, gives impression this will be a "reasonable" year in wage bargaining. Program adopted last week is softly worded—but it might be a velvet glove covering an iron fist. May accept a compromise package.

WILL START BUILDING SEAWAY THIS SUMMER — P. 79
Actual construction of the St. Lawrence Seaway is expected to get under way within the next 60 to 90 days. The immediate start is anticipated on both navigational and hydroelectric phases. As well as bringing ocean vessels to the Lakes, this will bring Labrador ore to midwestern furnaces cheaper.

STEEL EARNINGS STRENGTHEN USW STAND — P. 91
Steel companies reasonably good first quarter earnings bolster United Steelworkers hand slightly. Look for "package" deal with emphasis on pensions. Total cost to companies may be around 5¢-8¢ per hour. Price increase would follow. Why this recession has been a strange one—many trends run counter to 1949.

PUBLIC WANTS TO SEE THROUGH THE TOP — P. 94
First closed car had scarcely been developed when auto engineers and stylists started looking for the combination that would merge pleasures of an open ride with comfort of the conventional car. Rumble seat, convertible and hardtop resulted. Latest is the transparent top introduced this year.

BLAST SOVIET MANGANESE-FOR-FOOD HINTS — P. 99
Some Administration foreign trade experts, beguiled by Russian hints of scarce materials for food products, are working quietly toward a barter deal that would include volume imports of Red manganese. But the Soviet habit has been to cut off the U. S. in times of need. Domestic producers fearful.

the Week in Metalworking

ENGINEERING & PRODUCTION

ULTRASONIC TESTING LOWERS COSTS — P. 117
Cost savings in the manufacture of forgings can be obtained through the use of ultrasonic tests for determining ingot soundness before forging. Test is rapid, reliable and inexpensive. At Allis-Chalmers, about 50 ingots, ranging from 70-in. octagon to 42-in. ingots have been tested ultrasonically with good results.

USE OF PORCELAIN ENAMELS IS EXTENDED — P. 121
Extended usage of porcelain enamels in industry is attributed to new techniques and frit compositions. Many problems involving heat, corrosion, thermal shock and other service conditions are being solved. In almost every case, savings are substantial. Industrial enamels resist sulfuric and muriatic acid.

TITANIUM IS SUCCESSFULLY HOT EXTRUDED — P. 126
Recent titanium hot extrusion studies by Lockheed Aircraft mark a major step forward in fabrication of titanium. Lower costs for aircraft structural parts are expected to result through application of hot extrusion method. Titanium extrudes better than steel. Die filling is improved.

ASTE TOOLING IDEAS & SHOW HIGHLIGHTS — P. 130
Outstanding trends noted at ASTE Industrial Exposition were: More equipment is being designed for added flexibility and adaptability for short runs; cutting tools and holders are being designed to reduce setup, down time and grinding time; building blocks of automation were more in evidence than ever.

FREE FALL QUENCH CUTS TREATMENT COST — P. 134
Free fall quench handling of aluminum parts in salt bath furnace solution heat treatment has cut time required for operation by 40 pct. Method overcomes some disadvantages arising from conventional handling. In fall quench process, parts are suspended from pipe over tanks. Pipe can be moved from tank to tank.

NEXT WEEK—PLATING SETUP RECYCLES PROPELLERS
Several special engineering features built into new installation for zinc plating propeller blades have speeded operations 30 to 50 pct. More important, deposits are consistent. Plating for blade balance, a relatively new use for electroplating, is done by automatic recycling.

MARKETS & PRICES

WAREHOUSES FIGHTING ON THREE FRONTS — P. 71
Steel warehousemen are tightening their belts for a smaller steel market and at the same time they're girding for an invasion from three sides. Invaders are their own mill sources, now dipping into lower tonnage markets; low-priced foreign steel, and cutthroat competition from their own ranks.

NEW INVENTIONS FACE BIG INITIAL RISK — P. 74
It takes more than inspiration to build the better mousetrap. Every year, the U. S. Patent Office is flooded with 80,000 patent applications. And only 2.5 pct ever reach the money-making stage. It takes teamwork, time and money. Market research is a big factor. Price-usefulness ratio valuable.

SEEK STEEL EXPORT FREIGHT RATE CUT — P. 83
During the past 6 months, U. S. mills have felt the sting of competition from a rehabilitated and business-hungry foreign steel industry—both here and abroad. Foreign mills have been underselling us overseas despite ocean rate reduction and freight absorption. Now a rail rate cut is sought.

WHAT TOOL BUILDERS SHOULD LOOK FOR — P. 103A
NMTBA President Herbert L. Tigges told machine tool men to look for: (1) Continuing high manufacturing, (2) largest accumulation of obsolete tools in history, (3) cost consciousness among customers, (4) diminished but steady defense business, and (5) better government understanding of toolmen's problems.

TIME RUNNING OUT ON STEEL IMPROVEMENT—P. 179
If steel demand is going to improve, now is the time for it to start showing. The steel wage contract expires June 30; bargaining begins May 18. Chances are when bargaining starts getting serious steel users will decide they should reverse their inventory trend. This should begin to show in next 3 or 4 weeks.

ALUMINUM SHIPMENTS HIGHER IN MARCH — P. 182
Definite signs of the upturn in aluminum business are found in March shipment totals. All categories rose but rod and bar, forgings, sand castings. Foil sets its third straight monthly record. Copper continues to defy price-cut predictions and Kennecott is going back to a 6-day week.

spiral
conveyors
A complete line of Flights and Accessories for new and replacement service. A compact conveyor — no return strand — can be made dust-tight.
Catalog No. 803-B

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . . IT'S A JOB FOR JEFFREY!

THE IRON AGE

Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y. Oxford 7-3400

GEORGE T. HOOK, Publisher

TOM C. CAMPBELL, Editor

EDITORIAL STAFF

Managing Editor George F. Sullivan
News-Markets Editor Wm. V. Packard
Technical Editor E. C. Beaudet
Asst. Technical Editor W. G. Patton
Machinery Editor E. J. Egan, Jr.
Metal Finishing Editor J. J. Obrzut
Metallurgical Editor W. D. Latiano
Associate Editors: H. W. Van Camp, R. L. Hatschek, W. B. Olson, G. G. Carr, E. C. Kellogg; Assistant Editor: J. R. Whipple; Art Director: Carl Cerminaro; Regional Editors: K. W. Bennett, Chicago; R. D. Raddant, Detroit; Robert M. Lorz, Cleveland; J. B. Delaney, Pittsburgh; T. M. Rohan, San Francisco; G. H. Baker, R. M. Stroupe, N. R. Regelmbal, Washington; Editorial Assistants: L. Brass, M. Perrone, C. M. Markert, J. Dangler; Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; James Douglas, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

BUSINESS STAFF

CHARLES R. LIPPOLD
Director of Advertising Sales

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. William M. Coffey
Promotion Manager James A. Crites
Asst. Dir. of Research Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2.....S. J. Smith, T. H. Barry
1 N. LaSalle St. Franklin 2-0203
Cleveland 14 .....Robert W. Watts
1016 Nat'l City Bk. Bldg. Main 1-2263
Columbus 15, Ohio....Harry G. Mumm
LaVeque-Lincoln Tower Main 3764
Detroit 2.....Peirce Lewis
103 Pallister Ave. Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. Holy'd 7-0741
New York 17 ..C. H. Ober, C. T. Post
100 E. 42nd St. Oxford 7-3400
Philadelphia 39.....B. L. Herman
56th & Chestnut Sts. Granite 4-5600
Pittsburgh 22.....J. M. Spackman
1502 Park Bldg. Atlantic 1-1831
W. Hartford 7.....Paul Bachman
62 LaSalle Rd. Adams 2-0486
England .....Harry Becker
111 Thorley Lane, Timperley, Cheshire

OTHER EDITORIAL OFFICES

Los Angeles 28...2420 Cheremoya Ave.
San Francisco 11.....24 California St.
Washington 4.....National Press Bldg.

Circulation Representatives: Thomas Scott, James Richardson.

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, President

Vice-Presidents: Everit B. Terhune, P. M. Fahrendorf, G. C. Busby, Harry V. Duffy; William H. Vallar, Treasurer; John Blair Moffett, Secretary; George T. Hook, Maurice E. Cox, Tom C. Campbell, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Directors.

Indexed in the Industrial Arts Index and the Engineering Index.

Society of Business Magazine Editors

Business Publications Audit

National Business Publications

What Price Bellwether?

SOON steel labor and management will face a test of statesmanship. The outcome may influence significant trends in defense, foreign policy, inflation and in industrial stability.

Steelmakers have been over the barrel for years in labor negotiations. With few exceptions, trump cards have been held by the steelworkers' union. Those cards have ranged from active support of the New Deal and the Fair Deal to wars, shortages and natural growth in steel demand.

When the wage-price chain reaction started in 1937 both wages and steel prices left much to be desired. No one in the industry will deny that. Steel prices were chaotic. They had been driven down by senseless price cutting. Financial return to the steel industry in 1937 and 1938 represented somewhat less than security for steel firms and investors.

At that time steel labor was far down the ladder of well paid workers. But from 1937 on labor gained round after round of wage increases or fringe benefits or both. Steel wage rates and wages paid since 1937 have wound up substantially ahead of the rise in the cost of living. Steel labor today is close to the top of the list of highly paid workers.

There was a time when steel people insisted there was no tie between wages and prices. But as wage increases jumped from 8¢ or 10¢ an hour to 14¢ and even 18½¢ plus fringe, security for the industry demanded that higher wages be compensated for by price increases.

Steel has been called the bellwether of industry generally. Steel leaders have had a responsibility to other industries forced upon them even though they never sought and did not want that sensitive role.

Steel labor has a similar responsibility. It should not push steel people into a position where they are forced to take price action that can mean only instability for both. Today there is no sound argument for a steel wage cost increase or for a steel price increase. The market will support neither.

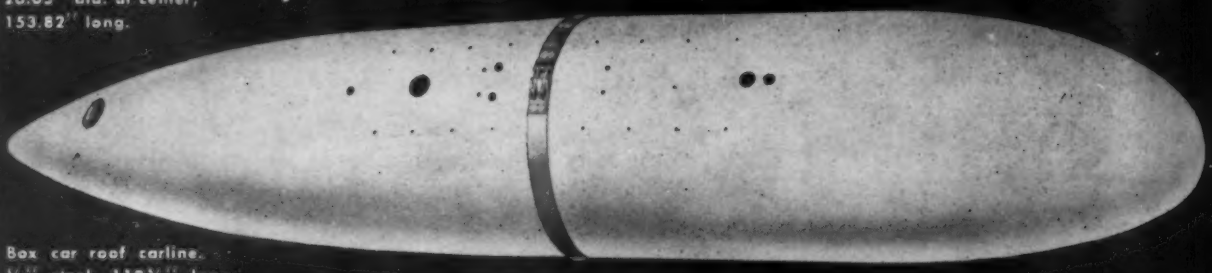
This is the time for the "bellwether" to call a halt in what appears to be inevitable yearly wage rounds. Steel management holds some trump cards. It should play them to forestall inappropriate labor demands.

Tom Campbell

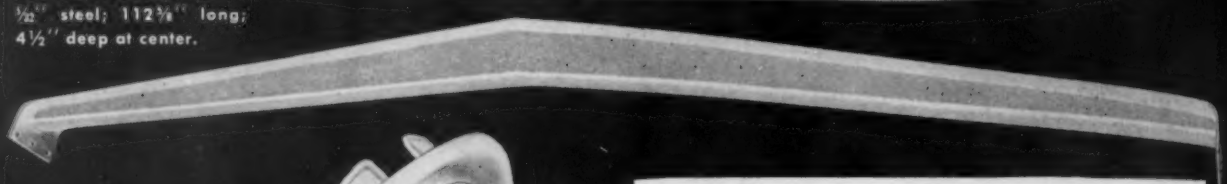
Editor

Transmission support cross member for automobile frame. Bolted, riveted and welded assembly. 21½" long; 8" high; 4" wide.

230 gallon pylon tank. .025" steel; 26.05" dia. at center; 153.82" long.

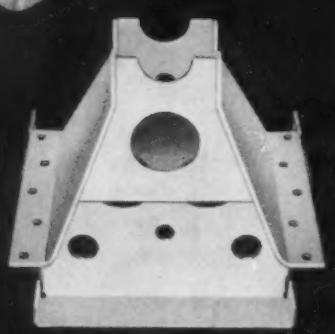


Box car roof carline. 1/32" steel; 112 3/16" long; 4½" deep at center.



Shaft bracket. .1345" steel; 8⅛" long; 6½" wide; 1 1/16" flange.

Welded bracket. 3/16" low alloy steel; 15¼" high; 12¾" wide; 11¼" deep.



Diffuser for commercial oil burner. 5/64" stainless steel; 11" dia.; 3⅜" deep.

Deep drawn body. .0747" steel; 6½" deep; 11 1/16" dia.

Simple—Complex! Big—Little! Any Analysis!

When You Need Pressed Metal Parts—
Research Aid—
Engineering Assistance—'PHONE PARISH!

Get the Cold Facts on Cold Formed Metal Parts from Parish.

Over 40 years' experience in COLD forming of metal parts gives you two major advantages: Cold forming means greater accuracy—no distortion, warpage or shrinkage. Cold forming means lower parts' cost.

Call, write or send your blueprints for engineering help and production quotations.

PARISH
PRESSED STEEL COMPANY
READING, PA.

Subsidiary of Dana Corporation
'phone 3-4211

Western Representative:
F. Somers Peterson Co.
524 Folsom St., San Francisco, Calif.
413 East 12th St., Los Angeles, Calif.

PARISH pressed metal parts for better products

Dear Editor:

Letters from readers

God and the H-Bomb

Sir:

The Mar. 25 IRON AGE has reached my desk. Thank you for the most significant editorial that I have ever read from your pen.

Please send me several copies of "God and the H-Bomb." I would like to use it in channels outside IRON AGE circulation, such as my Sunday School class and perhaps a church paper if the editor sees fit.

B. C. VAUGHN
Metallurgist
Research & Test Dept.

Navy Dept.
U. S. Naval Ordnance Plant
Indianapolis

Red Slave Labor Camp

Sir:

I have just finished reading the Apr. 22 issue of THE IRON AGE magazine and was particularly impressed with your news section special report entitled "POW's Tell About Red Slave Labor Camp."

I am interested to know if we might obtain permission to reprint this article in its entirety in our employee magazine "Chain Gang." There is, of course, no charge made for the distribution of our magazine.

E. G. FLANINGHAM
Supervisor of Personnel Records

Diamond Chain Co., Inc.
Indianapolis

Dial Feeding Devices

Sir:

On the Newsfront page of the Apr. 15 issue you discuss a development of dial feeding devices and, if available, we would be interested in more information regarding this.

E. E. BRAUN
Manufacturing Mgr.

Central Foundry Div.
General Motors Corp.
Saginaw, Mich.

A detailed article on this subject entitled "Dial Feeds Increase Press Capacity" appeared in our Apr. 22 issue.—Ed.

Ultrasonic Testing

Sir:

In the Apr. 22 issue under the section entitled, "Newsfront" on p. 115, there appeared the following item:

"Soundness of forging ingots can be determined rapidly and reliably before forging with a recently developed ultrasonic method. Applicable to medium and large sized forgings, the test helps cut scrap, permits revision of forging procedure to suit ingot."

Can you furnish us with further details as to the type of testing equipment used? Also, we are interested in knowing where we could obtain further information concerning this new testing procedure.

R. B. CORBETT
Director of Research

Heppenstall Co.
Pittsburgh

Further details may be obtained from Allis-Chalmers Mfg. Co., Box 512, Milwaukee.—Ed.

Hard Chrome Solutions

Sir:

As suppliers of plating materials in this country and Continental Europe, we have been approached by one of our agents in Switzerland who asks whether he could incorporate an article from one of your magazines in one of his write-ups on hard chromium plating.

The article referred to is "Hard Chrome Solutions" by R. A. Balbierz and H. D. Burgess (THE IRON AGE, Oct. 22, 1953) which appeared in our own "Metal Industry" on Jan. 1, 1954. May we add that we act as sole licensees for United Chromium, Inc. for the above areas and have special interest in articles such as these.

J. A. BECHTOLD
Director

M. L. Alkan, Ltd.
Middlesex, England

Popular Issue

Sir:

We would appreciate it very much if you would forward to us tear sheets of the following articles which appeared in the Apr. 15 issue: "New Low-Cost Coating Gives Mild Steel Good Corrosion Resistance," "Lower Foundry Costs Start With Part Design" and "How Dissolved Nitrogen Affects Graphitization."

E. C. WALLACE
Metallurgist

Barber-Colman Co.
Rockford, Ill.

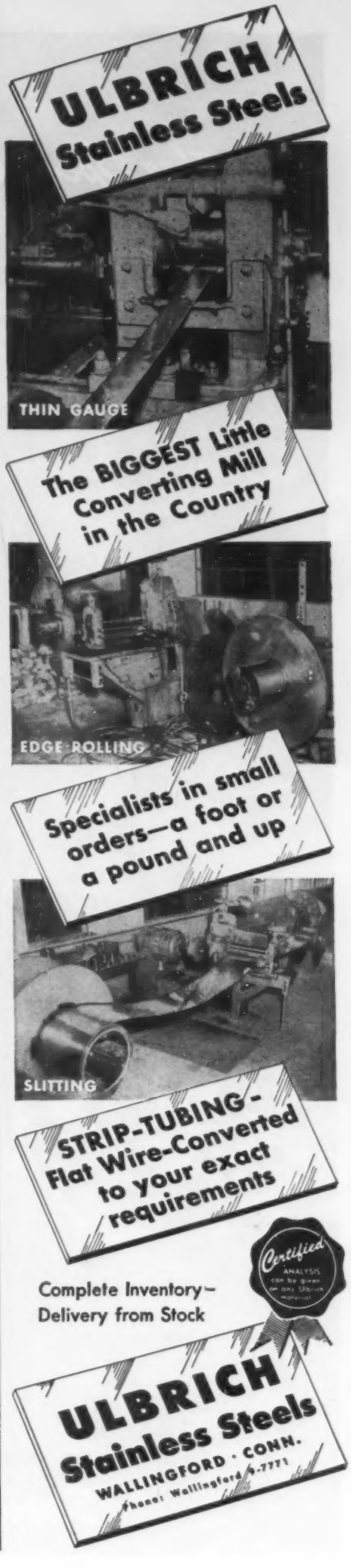
Measures Quenching Power

Sir:

We would greatly appreciate your sending us 15 reprints of R. F. Harvey's article, "Simple Test Measures Quenching Power of Salt Bath," printed in your Apr. 8 issue.

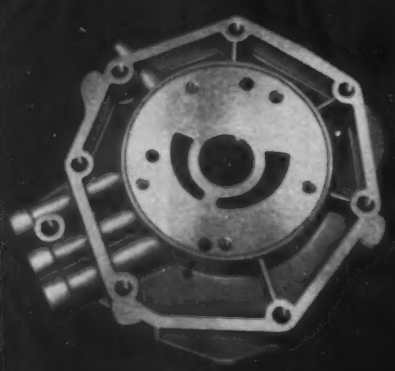
R. G. WILLAMAN
Executive Vice-President

Peterson Steels, Inc.
Union, N. J.



Another Special by Cross

Bores, Drills, Reams, Taps Aluminum Transmission Shaft Support



- ★ Turns rear face and counterbores large pilot diameter, drills 6 holes, drills and reams 2 locating holes, chamfers and taps 5 holes.
- ★ 128 aluminum castings per hour at 100% efficiency.
- ★ 6 station fluid motor driven index table with 1 loading and 5 working stations.
- ★ Hydraulic power clamping for work holding fixtures.
- ★ Complete interchangeability of all standard and special parts for easy maintenance.
- ★ Other features: Hydraulic feed and rapid traverse; hardened and ground ways; filtered coolant system; construction to J.I.C. standards; automatic work cycle.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

Fatigue Cracks

by William M. Coffey

Who Said That?

"You cannot bring about prosperity by discouraging thrift. You cannot strengthen the weak by weakening the strong. You cannot help the wage earner by pulling down the wage payer. You cannot further the brotherhood of man by encouraging class hatred. You cannot help the poor by destroying the rich. You cannot establish sound security on borrowed money. You cannot keep out of trouble by spending more than you earn. You cannot build character and courage by taking away man's initiative and independence. You cannot help men permanently by doing for them what they could and should do for themselves."

Like that? Here's some clues to the man who wrote it:

In 1831—He failed in business
1832—Defeated for the Legislature
1833—Again failed in business
1834—Elected to the Legislature
1835—Sweetheart died
1836—Had nervous breakdown
1838—Defeated for Speaker
1840—Defeated for Elector
1842—Married woman who went crazy
1843—Defeated for Congress
1846—Elected to Congress
1848—Defeated for Congress
1855—Defeated for Senate
1856—Defeated for Vice-President
1858—Defeated for Senate
1860—Elected President

By this time you know it was A. Lincoln.

Letters

Our 26 readers are writing us all the time. Have received these recently.

Mr. William Alrich, Managing Editor of *The Spectator*, the finest insurance authority since 1868, sent us a newspaper advertisement promoting metal tables with this headline, "Favorites from Wrought Iron Age Return." Mr. Alrich says ". . . don't tell me our civilization has gone through another Iron Age and I haven't noticed it?"

. . . and then there's a form letter which THE IRON AGE sent out in August, 1930, to our readers asking them, "after you have had an opportunity to examine it," for comments on a *Metal-Working Handbook* which we published at that time. We received Mr. Victor H. Severy's answer on Apr. 1, 1954, only 24 years later. Mr. Severy said it was a swell book, just wanted time to make sure.

A good friend from California sent us a clipping about Iron Age. Datelined London, Feb. 26, it said —"Airplanes at Heathrow Airport, west of London, are landing on the site of what is described as the first example of a prehistoric Iron Age temple recorded in Britain . . . Mr. Grimes has told members of the British Prehistoric Society about Iron Age pots recovered in this place." It all adds up. We celebrate our 100th Anniversary next year.

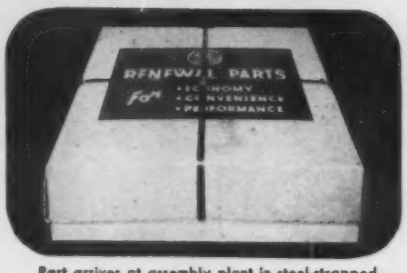
Puzzlers

Pretty easy that Apr. 22 puzzler about Eustace and Angus and the cost of the bottle. The answer: $1.02½. The winners: Robert V. Brown, the entire Rate Department & Works Manager's Office at General Steel Castings Corp., Granite City, Ill., including G.L.M., C.B., D.M.L., and T.R.E., Harry Bussel, Jack Harris, Barrett Eskay, David Greco, Margot Kistler, James Lucas, G. J. Morell and Howard S. Logan.

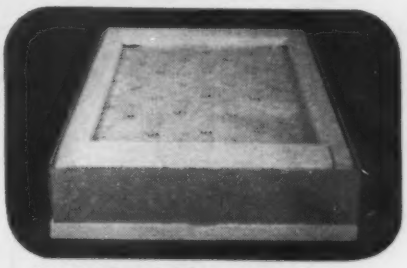
New Puzzler

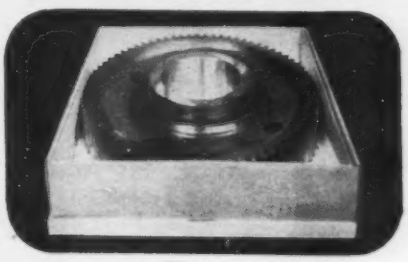
A man and wife, celebrating their twentieth wedding anniversary, have a son and twin daughters. The age of the wife equals the combined ages of the children. When the couple first met, three years before their marriage, the man's age was half again as much as the woman's. In as many years from now as each twin is now old, the combined ages of the parents will be half again as much as the combined ages of the children then. Double the husband's present age plus the present age of the son is equal to double the wife's age plus three times the age of one twin. When the couple's silver wedding anniversary arrives, the son's age will be half the age that his mother's will be then and equal to the combined present ages of the twins. If the family survives to the date of the golden anniversary, the son will be as old as his father is now and the combined ages of the children will be half again as much as the combined present ages of the parents. What are the present ages of each member of the family?

HOW MARVELLUM vpi® WRAP Speeds Assembly of Diesel-Electric Locomotives



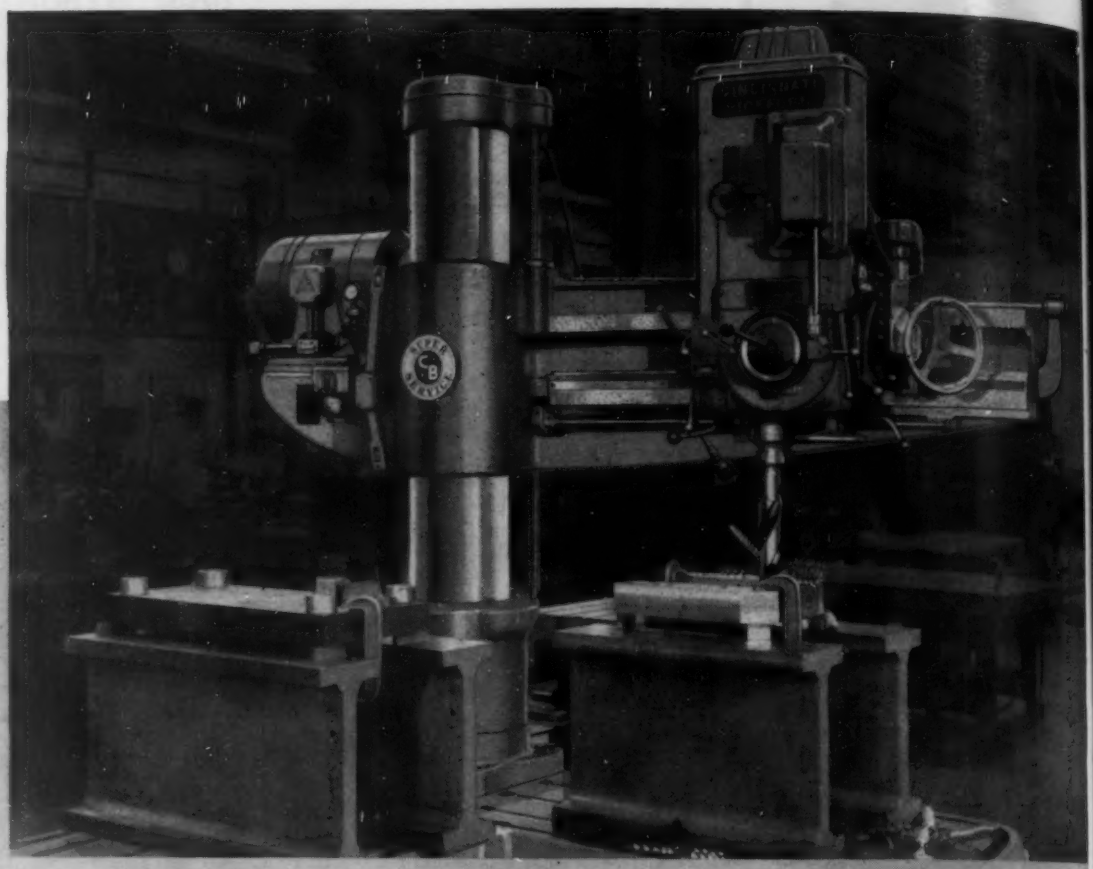
Part arrives at assembly plant in steel-strapped skidded carton ready for stand-by storage.


Removal of carton top reveals rust-preventive VPI cover sheet held in place by top blocking.


Gear, on bottom sheet of VPI paper, is clean, bright and ready for immediate installation. No messy, time-consuming degreasing delays the assembly of General Electric diesel-electric locomotives.

In shipment and storage, Marvellum VPI Wrap positively protects parts against rust. A special coating on the paper vaporizes and forms an invisible protective film around the item packed, preventing corrosion. Wherever prevention of rust is a factor, you can save time and money with VPI. To get all the facts about this revolutionary protective wrap, write for our fully descriptive booklet and generous VPI sample. Our technicians will be glad to discuss corrosion problems peculiar to your plant.

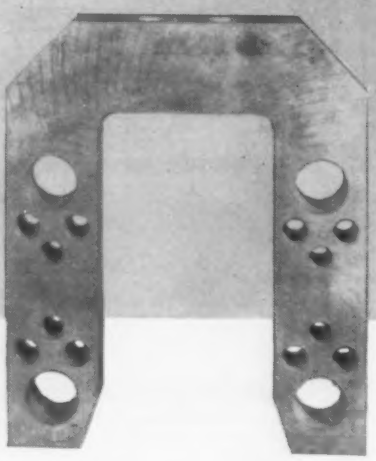
The MARVELLUM COMPANY
2 Appleton St., Holyoke, Mass.



50% SAVED

IN DRILLING OPERATIONS ON

PROGRESSIVE DIES, TOOLS, JIGS, FIXTURES



The piece shown is an anvil on horn tube Pierce die.

•

Photos courtesy Koppy Tool & Die Company, Ferndale, Michigan

The capacity and performance of this Cincinnati Bickford Super Service Radial has effected real savings in the shop at Koppy Tool & Die Company. On the operation shown a 50% saving was effected with the installation of this new Bickford Super Service Radial. eighteen holes are being drilled from 1 27/64″ to 3″.

Write for Catalog R 29 on Super Service Radials—there's a size for your needs.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Dates to Remember

Meetings

MAY

ALUMINUM WARES ASSN. — Annual meeting, May 16-18, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 1506 First National Bank Bldg., Pittsburgh.

INDUSTRIAL FURNACE MANUFACTURERS ASSN., INC.—Spring meeting, May 16-19, The Homestead, Hot Springs, Va. Association headquarters are at 412 Fifth St., N. W., Washington.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN., INC.—Annual convention, May 17-19, Waldorf-Astoria Hotel, New York. Association headquarters are at 814 Clark Bldg., Pittsburgh.

GAS APPLIANCE MANUFACTURERS ASSN., INC. — Annual meeting, May 19-21, Drake Hotel, Chicago. Association headquarters are at 60 E. 42nd St., New York.

ELECTRIC TOOL INSTITUTE — Spring meeting, May 23-25, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at Clark Bldg., Pittsburgh.

COPPER & BRASS RESEARCH ASSN.—Annual meeting, May 23-26, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

NATIONAL ASSN. OF PURCHASING AGENTS—Annual meeting, May 23-26, Conrad Hilton Hotel, Chicago. Association headquarters are at 11 Park Place, New York.

STEEL BOILER INSTITUTE, INC.—Annual meeting, May 24-25, Atlantic City, N. J. Institute headquarters are at 1308 Land Title Bldg., Broad & Chestnut Sts., Philadelphia.

AMERICAN GAS ASSN.—Production and Chemical conference, May 24-26, William Penn Hotel, Pittsburgh. Association headquarters are at 420 Lexington Ave., New York.

INDUSTRIAL DIAMOND ASSN. OF AMERICA, INC.—Annual meeting and convention, May 25-28, Claridge Hotel, Atlantic City, N. J. Association headquarters are at 124 E. 40th St., New York.

AMERICAN IRON & STEEL INSTITUTE —General meeting, May 26-27, Waldorf-Astoria Hotel, New York. Institute headquarters are at 350 Fifth Ave., New York.

STEEL KITCHEN CABINET MANUFACTURERS ASSN. — May 27 - 29, White Sulphur Springs, W. Va. Association headquarters are at 1008 Engineers Bldg., Cleveland.

JUNE

AUTOMOBILE MANUFACTURERS ASSN.—Annual meeting, June, Detroit. Association headquarters are at 320 New Center Bldg., Detroit.

EDISON ELECTRIC INSTITUTE — Annual meeting, June 1-4. Institute headquarters are at 420 Lexington Ave., New York.

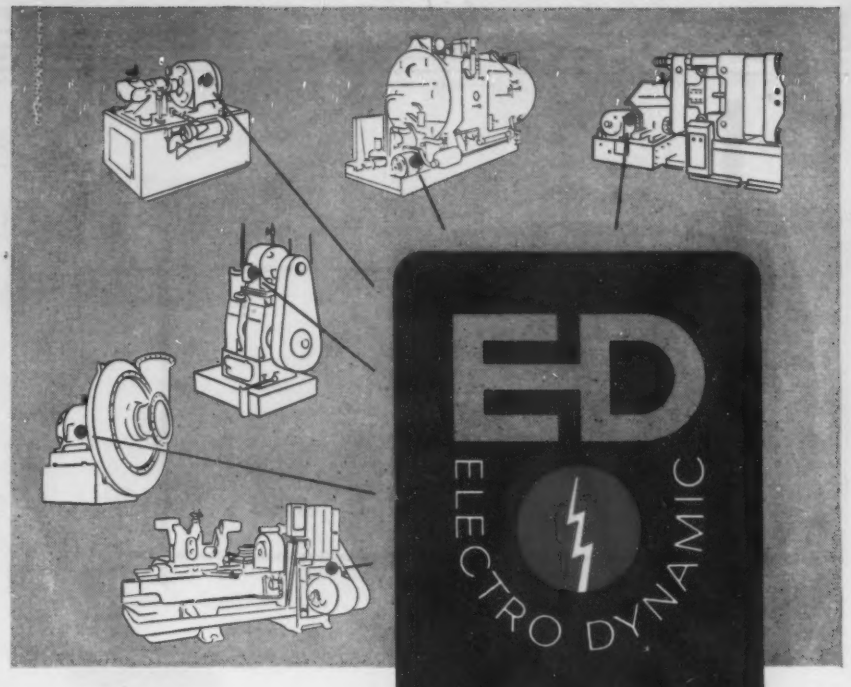
AMERICAN GEAR MANUFACTURERS ASSN.—Annual meeting, June 6-9. The Homestead, Hot Springs, Va. Association headquarters are at Empire Bldg., Pittsburgh.

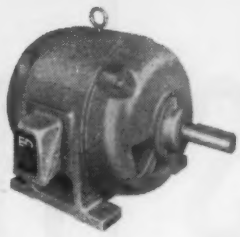
NATIONAL METAL TRADES ASSN. — Annual Western plant management conference, June 6-12. Association headquarters are at 122 S. Michigan Ave., Chicago.

SOCIETY OF AUTOMOTIVE ENGINEERS—Summer meeting, June 6-11, The Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J. Society headquarters are at 29 W. 39th St., New York.

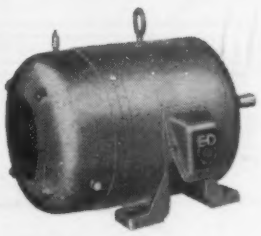
AMERICAN FOUNDRYMEN'S SOCIETY —Annual meeting, June 7, Chicago. Society headquarters are at 616 S. Michigan Ave., Chicago.

THE INSTITUTE OF COOKING & HEATING APPLIANCE MANUFACTURERS—Annual meeting, June 7-9, Netherland Plaza Hotel, Cincinnati. Institute headquarters are at The Shoreham Hotel, Washington, D. C.





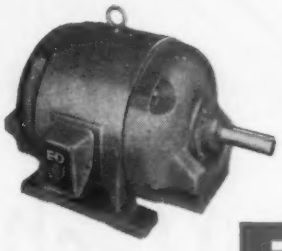
THIS EMBLEM IDENTIFIES EXTRA DEPENDABLE INDUSTRIAL MACHINERY



The red *power spot* on industrial machinery means "Powered by Electro Dynamic." Such machinery relies with confidence on the *extra dependability* of Electro Dynamic motors, the proven industrial motors which give industrial equipment *extra dependable* operation.

Conclusive evidence of the *extra dependability* of Electro Dynamic motors is now revealed in the new candid report **"MOTOR SHOWDOWN"**. The revealing proof is found in *comparative tests** conducted in accordance with A.I.E.E. standards. Don't miss your copy! Send the coupon below *today*.

*Tests certified by J. Arthur Balmford, Professor of Electrical Engineering at a leading Eastern university.



1 to 250 hp. AC and DC. Standard or special purpose. N.E.M.A. standards.

ELECTRO *xtra* **DYNAMIC** *ependable motors*

ELECTRO DYNAMIC · *Division of General Dynamics Corporation*
154 Avenue A, Bayonne, New Jersey

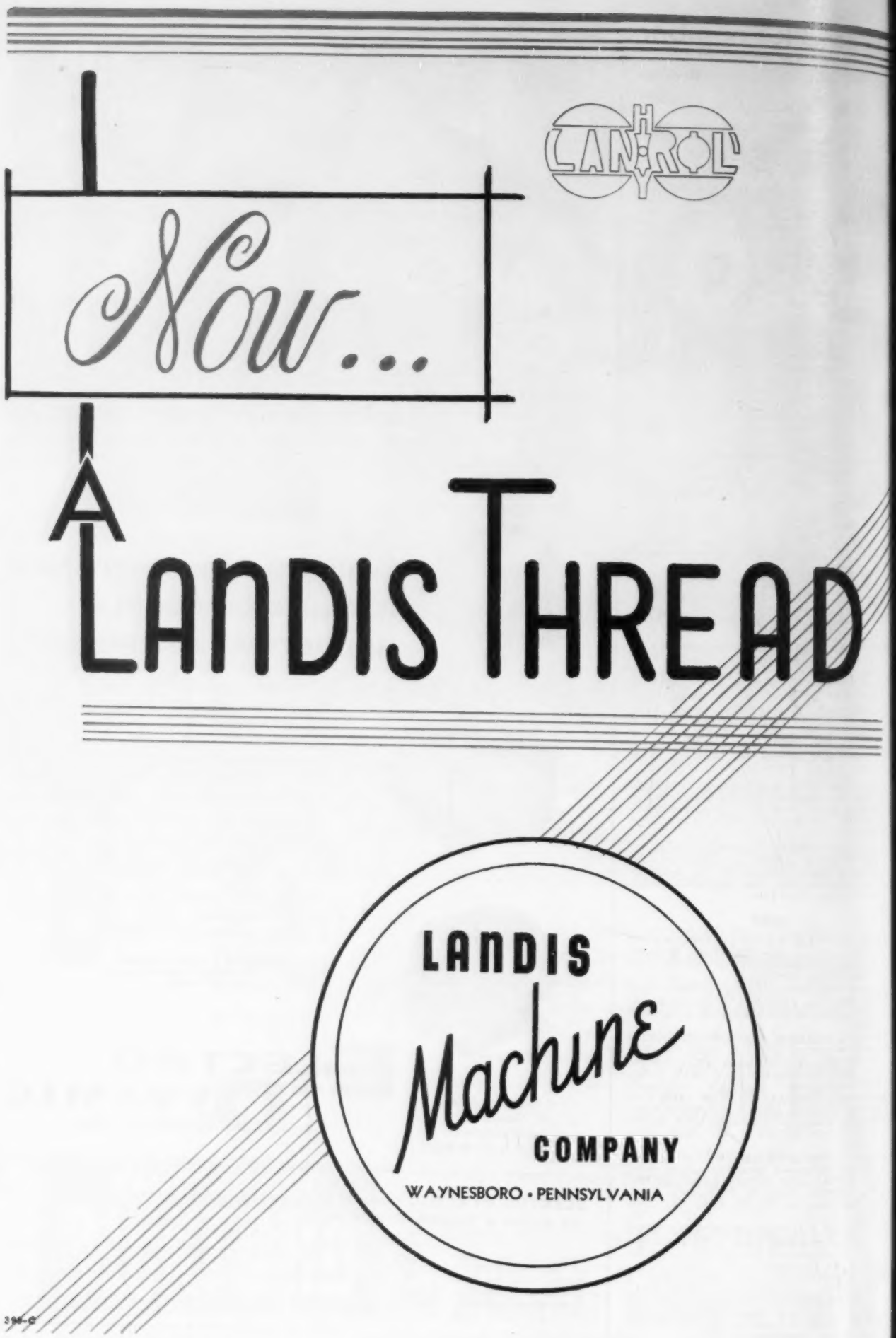
Please send me a copy of "MOTOR SHOWDOWN" and the new catalog of Electro Dynamic industrial motors.

ED MOTOR SHOWDOWN

NAME_____

COMPANY_____

ADDRESS_____


CLAN-HYROL
Now...
A LANDIS THREAD
LANDIS
Machine
COMPANY
WAYNESBORO • PENNSYLVANIA

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

LOOK FOR BOTH STEEL EXPORTS AND IMPORTS to decline this year. We exported 3.2 million tons last year, but foreign competition, currency problems, credit risks will whittle this figure. Imports last year were 1.7 million tons. In January this year they were 52,000 tons, lowest of any month since June of '52.

NUCLEAR POWERED MILITARY AIRCRAFT within the next 10 to 15 years are predicted by some aeronautical authorities. Designers also expect greatly increased fatigue life for aircraft metals.

A NEW ELECTRONIC "BRAIN" designed to sell in the $30,000 range combines a standard business machine with electronic circuit to provide lightning fast answers for business, engineering and science.

EFFORTS TO SPUR GOVERNMENT STOCKPILING of steel will make no headway. Some industry officials oppose it because: (1) Extra capacity has been built to handle emergency needs, and (2) military is never able to say in advance what grades or amounts of steel will be needed.

POWDERED METAL CONSUMPTION after a poor first quarter, is again climbing. Despite the late start this year, several producers believe they'll do the same sales volume in 1954 as last year.

SOME FAIR SIZE CONTRACTS FOR FUSES for military shell production are still being let. Despite some curtailments in projectile output, fuses are holding up fairly well. One explanation, tolerances were, in some cases, so strict as to price the finished fuse component out of the profit making class.

INCREASE IN HARDNESS IN MOLDED RUBBER PARTS equivalent to a 4-year aging cycle plus better resistance to sub-zero cold are claimed for a new heat treatment process. Steam prevents sticking, improves work quality.

SYNTHETIC RESINS LAMINATED INTO MAHOGANY BOARD used for steel die models have proved successful at one auto plant. The impregnation reduces swelling and shrinking due to changes in heat or moisture. It has reduced costly reworking of die models as well as speeding production.

A NEW SEMI-AUTOMATIC WELDING AND HARD FACING process using a ferromagnetic flux gives the speed and high deposition rates of automatic welding with the visibility and flexibility of hand arc welding. Flux is hopper fed, held on electrode by magnetic field created by welding current.

RECENT FREIGHT RATE REDUCTIONS ON IRON AND STEEL shipments will cost railroads plenty if volume is not regained from competitive truckers. One road estimates cuts at $9 million annually based on volume on effective date. Shift from trucks to rail to take advantage of lower rates has been negligible thus far.

ALUMINUM INDUSTRY IS GOING ALL OUT in battle with steel for truck body market. Aluminum already has virtually cornered truck trailer business, thinks it can do same on so-called dry bodies, dump trucks. Estimated potential in next year is 235 million lb.

STEEL TUBING DESIGNED TO MEET YOUR SPECIFICATIONS

PATCO manufactures steel tubing for a wide variety of pressure and mechanical applications.

PATCO
FOR SERVICE AND RELIABILITY

PACIFIC TUBE COMPANY
specializes in the manufacture of tubing from stainless, carbon and alloy steels. Patco produces cold drawn seamless tubing, welded tubing, and cold drawn bars. Write for our catalog.

PACIFIC TUBE COMPANY
5710 SMITHWAY STREET,
LOS ANGELES 22, CALIFORNIA
WEST COAST REPRESENTATIVES FOR
SUPERIOR TUBE COMPANY, NORRISTOWN, PA.

patco

STEEL: Warehouses Wage Triple Battle

Markets invaded by mills, foreign steel producers, tough competition . . . Predict smaller warehouse share of steel market . . . Price cutting hurts sales—By *R. D. Raddant.*

Steel warehousemen are tightening their belts for a smaller steel market and at the same time girding for an invasion from three sides of territory jealously guarded by their ranks as strictly private property.

The invaders are their own mill sources who are dipping into the small-tonnage market, low-priced foreign steel, and cut-throat competition from within their own ranks in the form of price slashing, secondary products, and unloading of distress steel.

NEWLY-ELECTED vice-president of American Steel Warehouse Assn. is C. L. Hardy of Joseph T. Ryerson & Son, Inc., Chicago.

Underneath the veneer of convention conviviality, most members of the American Steel Warehouse Assn. wore looks of sober reflection and serious speculation as they talked over their problems last week at the organization's 45th annual meeting in Chicago.

When pressed for their views, they did not hesitate to predict tough business prospects for the coming months and unanimously expressed concern over the inroads made into their traditional market.

One of the most cheerful of those interviewed was C. L. Hardy, of Joseph T. Ryerson & Son, who was named vice-president of the association for the coming year.

Warehouse Share Smaller

He predicted a last half of 1954 that would show gains over the first half, although "moderately so." He based this opinion on the amount of "distress liquidation" that will characterize the entire first half, but should decrease as the year goes on.

He divided this liquidation into two categories: first from the "hit-and-run" operators who had to sell out at lower than market price and secondly from warehousemen's own customers who were overloaded with inventory.

"We will have to adjust to a smaller share of the market," declared one Cleveland man. "Where warehouses have been selling 19 to 20 pct of the total steel produced, they will have to drop down to the 1936-37 level where warehouses took probably 15 to 16 pct."

Stabilize Pricing

"We have to realize that some business that the warehouses took rightfully belonged to the mills," another conceded. "When things were tough the buyers kidded us that some of the orders placed with us would stay warehouse business although rightfully it was mill business."

"Establishing a stable price structure is the most essential problem," a third said, "although by that I don't necessarily mean agreement on prices. The fact is that a lot of new people don't realize that low prices don't automatically mean more business."

These off-the-cuff remarks, origginating in the lobby, corridors and barrooms of the Drake Hotel, appeared to back up the evaluation of industry conditions of Walter S. Doxsey, association head.

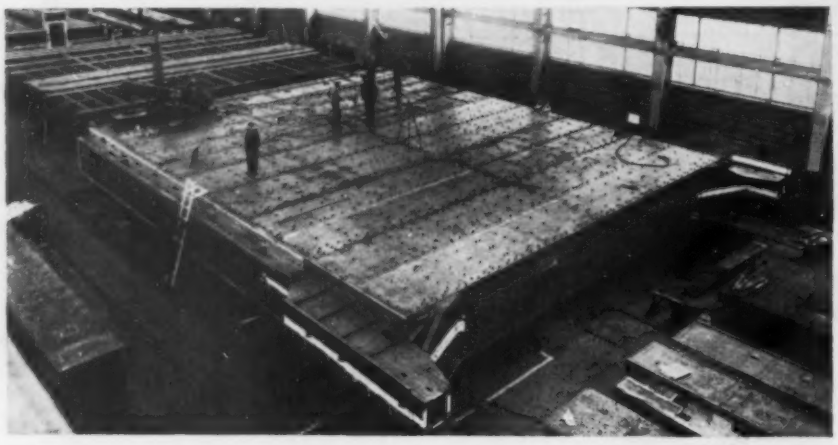
He warned members that they would have to take a realistic look at the market and not to consider the boom year of 1953 as normal.

"Filling of back orders is not the warehouse business as we knew it," he reminded them. But he also listed favorable developments in the traditional competition between warehouse and mill for business.

"Filling of back orders is not the warehouse business as we knew it"—Walter S. Doxsey, president, American Steel Warehouse Assn.

"The high speed production order is costly to the mills," he said, "but they haven't realized it yet. We also can capitalize on the high cost to the mill of shipping small tonnages."

Turn Page



DRILLING, reaming water gate prior to riveting skin plates.

Fabrication:

Dominion Bridge builds pair of monster water gates.

Two of the largest hydraulic control gate installations of their kind in the world have recently been designed and built by Dominion Bridge Co. Ltd. They are tunnel entrance control gates for the Sir Adam Beck Generating Station No. 2 of the Hydro-Electric Power Commission of Ontario near Niagara Falls, Canada. These tunnels are used to deliver water to the head pond of the power house.

Gates are largely riveted although welding has been used in certain sections. Weighing about 225 tons each, the control gates are 58 ft high and 45 ft wide.

Consisting of horizontal riveted plate girders framing into vertical end box girders, the gates were completely assembled in the shop on their backs, with the skin plate on top. Offset lifting lugs at the top, welded and stress relieved, were riveted in place.

Chilled cast iron rollers 42 in. in diameter carry the hydraulic load. They are equipped with bronze bushings rotating on low alloy steel pins. All parts were carefully aligned and fitted in the shop to reduce field work. Gates were then disassembled and shipped in the largest sections which could be conveniently handled at the site. All field joints were riveted, then caulked.

Embedded parts for each gate, weighing about 42 tons per set, consist basically of a pair of planed carbon steel roller paths 62 ft long, welded to heavy plate sections to form box girders. These distribute roller loads on the concrete. A planed sealing angle on the upstream side, joined to the roller path section by the side liner plates, completes the embedded part assembly. These were also completely assembled in the shop.

Gate is supported by a pair of 10-in. OD steel screws about 71 ft long which were made by Camden Forge Co.

The bronze lifting nuts, made by the same firm, are supported in forged steel trunnions in the end lifting lugs of the gate. Screw rotating machinery consists of an electric-motor-driven central gear case connected to end gear cases on each side that rotates the screws. Hoist speed of only 4.5 in. per minute was specified.

Hoist machinery is supported in a frame arch rising almost 75 ft above the ground.

Special Report

Continued

At the same time, he hit at mill practices that are causing concern to warehousemen.

"The need for equitable extras is as keen as 15 years ago," he said. "We can ask that our sources of supply don't sell warehouse stocks at lower prices than warehouses."

End Price Cutting?

He pointed at payment by mills of commissions to distributors and the amount of secondary steel, particularly sheets, that is going into the market. He blamed the auto industry for the excess of seconds saying that the pressure for tonnage and demand for high quality has resulted in a disproportionate production of prime and secondary flat-rolled.

But while association members were unanimous in condemning price cutting, pushing of secondary quality steel, and buying and selling distress steel, almost everyone of them had to do it with tongue in check.

Price cutting in Detroit, for example, has been rampant for months. Large blanks have been available at lower than mill price. Stamping plants have made good use of secondary steel which can work as well as prime quality for certain jobs. The same warehousemen who complained loudest against price cutting by others were often named themselves as leading offenders.

Nevertheless, with the folding up of the opportunists and the drying up of distress steel, warehousemen indicated they were ready for voluntary self-disciplining.

Foreign tonnage is a different matter and Mr. Doxsey took a dim view of the millions loaned by the U. S. for modernization of foreign steel production. He said $171 million have been loaned for foreign steel production for mills, mines, docks and other facilities. Imports in 1953 increased 16 times over 1952, he pointed out.

He also stressed the increased competition from the multiplying number of steel outlets in new warehouses.

"We can't properly criticize the mills from selling to whomever wants to buy, but running rampant can breed destruction," he warned.

STAINLESS: Revise Flat Rolled Prices

U.S. Steel sets new base, extra charges for sheet, strip . . . Reflect production cost more accurately . . . New prices aimed at encouraging use of coiled items—By J. B. Delaney.

Base and extra revisions on stainless steel sheets put prices on a more realistic basis in relation to production cost.

U. S. Steel Corp. took the lead in making changes which reflect economies through use of continuous mills, as well as the high cost of producing certain grades on hand mills. Other producers are expected to fall into line.

The revisions give a break to consumers of coils and will encourage fabricators to switch to coil stock where possible. For consumers of cut lengths reductions in base prices are largely balanced by increases in extras.

However, the switch from cut lengths to coils would not come overnight. Consumers not now using coils would have to install additional flattening and leveling equipment.

Cut Strip Prices

Another result of the changes is that base prices of sheet and cold rolled strip are now on a common basis. Six grades of cold-rolled strip were reduced from $25 to $225 per ton to bring the entire list into line. Five grades of hot-rolled strip were cut $20 to $95 per ton.

U. S. Steel had discontinued production of grades 314 and 403 in sheet form.

Base price reductions in sheets range from $30 to $180 per ton. Types 309, 310, 317, and 446 are unchanged. Types 318 and 420 are up $45 and $70 per ton, respectively. These grades must be produced on hand mills.

Offsetting the base price reductions for cut length consumers are gage and width extra increases ranging from $100 to $160 per ton. Gage and width extras for coils now run $40 to $330 below cut length extras depending on gage.

Prior to the revisions the coil consumer was paying the same gage and width extras as the cut length user.

The coil purchaser's advantage is moderated somewhat by higher scrap loss due to the fact that coils are shipped as they come off the mill unless obviously defective. Cut lengths are inspected individually before shipment.

Due to mill limitations, U. S. Steel produces coils to a maximum width of 48 in. Cut length widths range from 24 in. to over 66 in. To date cut length sales predominate in widths 24 in. and over, while coil tonnage is greatest in the narrower widths.

Other changes by U. S. Steel include a new extra table covering small coils, based on coil weights and gage; length and weight tolerances and the 33 1/3 pct circles extra will apply to cut lengths only.

Stainless steel sales have been disappointing so far this year. During the first quarter producers grew optimistic, as they thought they detected signs of a pickup in stainless business. But they were sorely disappointed when the pickup failed to materialize.

Now stainless demand is again showing slight improvement and producers are encouraged. But, having misjudged the market first time 'round, they are now cautious—they say they are not sure current slight improvement indicates a trend.

But the long term trend of stainless demand is upheld; use has doubled in every decade since about 1920.

U. S. STEEL STAINLESS PRICE CHANGES

Type	Old Price (base price ¢ per lb)	New Price	Change (Per Ton)
SHEETS			
301	46.25	38.25	Off $160.00
302	46.50	41.50	Off $100.00
302B	48.75	44.75	Off $ 80.00
304	48.75	43.75	Off $100.00
304L	54.00	49.00	Off $100.00
305	51.50	46.50	Off $100.00
308	55.25	48.00	Off $145.00
309	63.50	62.00	Off $ 30.00
309S	68.50	68.50	No Change
310	72.25	72.25	No Change
316	64.25	62.75	Off $ 30.00
316L	69.50	67.75	Off $ 35.00
317	77.00	77.00	No Change
318	78.00	80.25	Up $ 45.00
321	55.50	50.50	Off $100.00
347	60.75	59.25	Off $ 30.00
405	42.50	39.75	Off $ 55.00
410	40.75	34.25	Off $130.00
420	49.25	52.75	Up $ 70.00
430	43.50	34.75	Off $175.00
430TV	48.75	39.75	Off $180.00
431	44.00	35.25	Off $175.00
446	59.75	59.75	No Change
501	30.50	29.00	Off $ 30.00
502	31.75	30.00	Off $ 35.00
STRIP			
HOT-ROLLED			
310	67.50	62.75	Off $ 95.00
316	56.00	53.25	Off $ 35.00
316L	60.25	58.25	Off $ 40.00
321	42.00	41.00	Off $ 20.00
446	53.00	50.25	Off $ 55.00
COLD-ROLLED			
310	78.00	72.25	Off $ 75.00
316	66.50	62.75	Off $ 75.00
316L	71.75	67.75	Off $ 80.00
317	79.25	77.00	Off $ 45.00
321	54.50	50.50	Off $ 80.00
446	71.00	59.75	Off $225.00

INVENTIONS: Face Big Initial Risk

Only 2.5 pct of all patent applications reach money-making stage . . . Drive to bring business, inventors together . . . Marketing new product takes teamwork—By *R. M. Lorz.*

It takes more than inspiration to build a better mousetrap. Every year the U. S. Patent Office is flooded with an estimated 80,000 patent applications. Of this number only 2.5 pct ever reach the profit-making stage. These figures illustrate the risk any company faces in deciding to promote a new idea.

Can Lose Shirt

Within the past few decades heavy corporate taxation has taken the real meaning out of the term "venture capital." Before any manufacturing firm moves ahead with a new product today every stone is turned to make sure the new item has been thoroughly market tested.

Despite elaborate precautions, some firms still lose their corporate shirts in the early stages of the game. These firms usually fail to realize the inventive climate has changed. Greater risks and development costs have led to a concerted drive to bring the independent inventor and the manufacturer closer together. In order to successfully bridge this gap progressive thinkers have discarded old hat notions about the attic genius locked in a death struggle with someone bent on stealing his invention.

Is It Better, Cheaper?

Marketing a new product these days takes teamwork, time and a lot of money. Need for this kind of cooperative effort was highlighted recently by Cleveland Engineering Society at its first annual inventions exhibit and conference. Speakers and guests agreed that manufacturer, inventor and patent office all have vital roles to play. In an advancing technology, elaborate research set-ups have a definite place—but they aren't curealls. Industry must still give each and every outside idea a close examination.

If the inventor does come up with a good working model that seems to have potential, the manufacturer must first determine if it is better and cheaper. This isn't easy. But many firms have found the so-called usefulness-price ratio invaluable in deciding whether or not to market a new product.

Lower unit costs are not always the deciding factor in determining potential success. Take the decision a few years ago to market a product 1200% more expensive than any competing item. Gamble on a $25 pop-up toaster paid off.

Stairway to Invention

1. **State objectives. Aim for the most ideal form.**
2. **Get everything down on paper and analyze even the smallest details.**
3. **Study the materials and forces surrounding your ideas. Edison became a recognized authority on gas illumination before inventing the electric light bulb.**
4. **Create numerous alternative solutions. Get out of the rut.**
5. **Check prior art. Put your patent attorney to work or go to the library yourself.**
6. **Keep patent opportunities in mind. Design around infringement.**
7. **Select the best form. Even if unit price is higher it can still score highest on the price-usefulness ratio chart.**
8. **Build it. Reduction to practice is your most saleable and protective step.**
9. **Design for appearance. Remember, the ladies do 80% of the buying.**
10. **Keep basic invention records. Starting dates, inventions disclosures will give you the legal protection you need.**

Electric shaver and mechanical pencil are further examples.

Importance of all-out market testing has been stressed repeatedly. Unless consumers in a selected area have the chance to test a new product, a manufacturer can never be quite sure that unexpected bugs won't crop up. One plumbing firm lost an estimated $200,000 recently because no one had any idea that plumbers would not be able to reassemble a new part. Many firms will spend 80 pct of their initial investment on market testing to eliminate costly errors.

Contract Is Important

Before actual development of an invention is undertaken, a mutually beneficial contract has to be worked out with the inventor. Many firms pay a reasonable amount for licensing while development work is going on.

More serious mistakes have probably been made at this stage of the game than at any other. Good ideas have been sidetracked too often either because the inventor made outlandish financial demands or the company failed to give positive assurance that development and production would be realized within a stipulated time interval.

Really sound contracts necessarily have to be two-way affairs: Company sets up a definite schedule and the inventor agrees to wait for a firm royalty agreement until the new product is on the market and bringing in a profit.

Works on Scale

Arriving at royalty formulas is, of course, a highly individual matter. But in many cases where consumer items are involved, the manufacturer agrees to pay the inventor as much as 5 pct of net profits. Royalty payments are gradually scaled downward every 5 years.

Successful inventors say there is nothing mysterious about inventing or inventions. In a recent survey of personality traits most desirable in the inventive field over 700 experienced men rated perseverance and imagination well above mechanical ability. Inventors

who regularly ring the bell with new ideas trace most of their success to scientific method.

An analytical, common sense approach will most often produce the widest variety of ideas. Much stress is placed on getting the idea down on paper in its most ideal form. From that point on the inventor has to design his way around infringement by searching for as many alternative solutions as possible.

This ability to climb out of the rut is probably the good inventor's most productive asset. Those who should know say the habit of finding another way can be cultivated if the first plausible solution to a problem isn't accepted as the only solution.

Patents Take Time

Representative of a large sewing machine company told conference visitors his company's research people were able to devise 20 new variations on a functional machine element on which over 20,000 patents had been issued in the past 100 years.

Patent office officials who attended the conference promised inventors they would continue to give the broadest possible protection with the least amount of red tape. They also asked inventors to be patient with processing delays since some 600 patents are being issued each week.

"Stupidity annoys it."

REPLACEMENT: What's Needed?

AMA group considers role of capital replacement in expanding economy . . . Tax depreciation, leasing, finance problems vital . . . Need accurate cost control—By J. R. Whipple.

U. S. industry's ever growing demand for faster replacement of increasing amounts of capital equipment, and the tighter supply of money available for this item on corporation budgets was the problem that held the interest of some 600 controllers and other executives at a 2-day American Management Assn. conference in New York last week.

Lead-off speaker at the first day's session was Melvin H. Baker, chairman of the board of National Gypsum Co. Mr. Baker stressed the vital role of sound capital equipment replacement in helping industry meet the demands of our fast-growing economy. With the U. S.'s projected 1975 population pegged at 190 million, the gross national product doubled and a relatively smaller labor force, increased productivity is the only way in which industry can meet the challenge.

Need More Capital

And only modernized plants with efficient machinery can produce more goods with proportionately fewer employees. Thus the outlook is for a continually rapid rate of obsolescence during the 20 years immediately ahead and a resultant need for greater capital investment in replacements.

Robert N. Lyon, head of the Economic Survey Div. of Standard Oil Co. (N. J.), discussed his company's approach to economic planning and setting up projected capital expenditures. Standard Oil's plan was set up in depth covering four points: 1. General studies of economic factors; 2. specialized study of the general economic background in the specific industry; 3. setting up a workable plan of future operations of the individual company, and 4. determination of price factors and capital outlook through coordination of findings of the other surveys.

Heading the second day's list of speakers, Frederick J. Muth, assistant controller of Armstrong Cork Co., weighed the alternatives of leasing or purchasing as methods of acquiring capital items. Mr. Muth told AMA members that life insurance investment in leasing has grown from $80 million in 1946 to almost $1 billion by the end of 1952.

Chief advantage to leasing, insofar as real property and structures are concerned, is the freeing of funds for working capital purposes. Turnover of capital employed can be readily speeded up with the release of funds otherwise invested in bricks and mortar to permit production and sales expansion.

Boost Tax Writeoff

Another strong argument for leasing is minimizing of the obsolescence risk. This is particularly valid in the case of production machinery where rapid changes in techniques can make outright ownership an expensive gamble.

Depreciation as a governing factor in replacement policy, with a special reference to the present tax laws and incipient changes was the topic discussed by J. Henry Landman, tax lawyer and Professor of Tax Law at New York Law school. Mr. Landman noted that the pending tax bill of 1954 (H. R. 8300) also offers taxpayers the declining balance method of taking depreciation write-offs instead of the conventional straight-line method as a stimulus to help national economic revival.

Advantages Doubtful

The declining balance method offers twice the appropriate straight-line rate on new plant and equipment so that the taxpayers will be able to write off two-thirds of the cost in the first half and 40 pct of the cost in the first quarter of its useful life, he explained.

Mr. Landman expressed doubt as to whether the declining balance

Production Capacity DOUBLED...

KEYSTONE

"SPECIAL PROCESSED"
COLD HEADING WIRE
for

- Phillips Head Screw
- Clutch Head Screws
- Cross Recessed Head Screws

The unique upsetting qualities of Special Processed wire are recognized by licensed recess head screw manufacturers across the nation. The excellent flow properties of this superior cold heading wire together with its structural soundness give this wire unsurpassed performance on difficult cold heading jobs.

To meet the ever-increasing demand of new customers while continuing to serve its present customers, Keystone is doubling its production capacity on Special Processed wire. We'll be glad to show you how Special Processed wire can improve the quality of your product and lower your production costs. Write us for additional information.

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

would have a favorable effect upon our national economy. "Taxpayers engaged in services, retailing and wholesaling where plant and equipment are not essential" he said, "would not directly benefit by this policy. By contrast, those engaged in manufacturing would profit thereby but they would need new capital to enjoy it. The small manufacturers do not have sufficient reserves, certainly not cash, to avail themselves of this benefit.

It is questionable whether the banks and the public at this time would lend or invest for such a purpose," Mr. Landman declared. "The heavy long-life plant and equipment of 25 years or more as compared with the short-lived equipment is actually not benefited enough in annual dollar deductions to make the declining balance method more attractive than the conventional straight-line method."

Cut Double Tax

"H.R. 8300 also offers the elimination in part of the so-called double-tax on dividend income, once as corporate and again as individual incomes when received as dividends," Mr. Landman reported. "It is contended," he said, "that this situation discourages equity and encourages debt financing. Any mitigation of the double tax on dividend income is preferential legislation. About 8 pct of U. S. families own public corporate stock, and sixtenths of one pct of American families own 80 pct of all publicly held stock. This latter group needs no further inducement to invest in American enterprises."

Herbert E. White, president of Cleveland Hardware Co., outlined his firm's system of educating employees to the economic need for replacement of machinery which may temporarily dislocate jobs and wage rates. Employees at Cleveland are given a thorough briefing in management's plans for company expansion and are shown how changes will benefit them through greater productivity and profit.

The need for an integrated system of capital controls and the way one large company set them in motion was discussed by L. C. Guest, Jr., Controller of Sylvania Electric Products.

UNION: USW Sets Down Demand Policy

Wording of four-point program is mild . . . May be a "reasonable" bargaining year . . . Might accept 5¢ to 8¢ package . . . Objectives not spelled out—*By J. B. Delaney.*

United Steel Workers of America, confronted with widespread unemployment and reduced work weeks in the steel industry, gives the impression this will be a "reasonable" year in their contract negotiations with steel producers.

David J. McDonald, union president, seems to cringe at the thought of strong language concerning outcome of contract discussions scheduled to begin May 18 with U. S. Steel Corp., and other producers.

The four-point program adopted at Pittsburgh last week by the union's International Wage Policy Committee was mildly worded, unlike some earlier statements of policy when economic conditions in steel and industry generally were much better than they are today.

But this may be the velvet glove that conceals the iron fist. Mr. McDonald is by nature rather soft-spoken and his thinking is reflected in the union's approach to various issues. He doesn't believe in vilifying the industry that provides bread and butter to his members.

What Union Wants

In actual bargaining sessions, McDonald is still a labor leader. And he still must emerge from them with something he can sell to his members. What that something will be is likely to represent a compromise package that will add from 5¢-8¢ an hour to industry employment costs.

The union's 1954 wage policy includes demands for higher wages, improved insurance and pension plans, the guaranteed annual wage, and better terms on all other phases of the agreement.

None of these objectives is spelled out, but the union is believed to be thinking in terms of 3¢-5¢ on wages, and as much as $125 or more minimum monthly pensions. It wants a greatly expanded health and insurance program with the industry footing the entire bill, which is now shared equally by the companies and the workers.

Mr. McDonald is making motions on the guaranteed annual wage but he recognizes this as a long-term objective. Some industry sources believe GAW will never be achieved. Mr. McDonald said the union's proposals on GAW might cost the industry between 5¢-7¢ an hour.

Not a Strike Deadline

Last week's meeting was one of the quietest in the union's history. At press conferences following the sessions, Mr. McDonald was cagy about defining the union's precise objectives. In fact, he was cagy about saying anything about anything.

Asked whether contract expiration date of June 30 could be considered a strike deadline, Mr. McDonald replied: "It would not be proper to refer to June 30 as a strike deadline." He explained the USW is hopeful of concluding negotiations peaceably.

Industry spokesmen have made clear their position that market conditions will not sustain labor cost increases exceeding a few cents an hour. They will go into negotiations with the thought of concessions on pensions and social insurance only.

There is a possibility the companies might propose a 90-day extension of the contract to Sept. 30 at which time both sides would take another look at economic conditions.

The union justified its demand for higher wages on grounds of increasing productivity, profit position of the industry and economic conditions generally. On pensions and insurance it asserted the present programs were negotiated in 1949, that experience under the plans, modifications in social security laws and depreciated value of benefits "all point to the necessity for enlarging and improving the insurance and pension plans."

BENJAMIN F. FAIRLESS, U. S. Steel chairman, blows out candle on 64th birthday cake presented him by union representatives.

SHEETS are held snugly at end on C&O gondola car by movable bulkhead.

Loading:

Movable stops block sheets, coil in C&O's new gondola car.

Chesapeake & Ohio Ry. has recently developed a gondola car designed to carry sheet and coil steel without damage yet cut loading costs. C & O hopes the new system will result in savings attractive to steel shippers now using truck transportation.

Car is equipped with a cushioned steel platform which floats on H-type beams, which in turn ride on flat steel plates. End bulkheads of the car are faced with plywood, and adjustable rubber-faced stops lock the load and hold it secure. These bulkheads operate like the movable partitions in a file drawer.

Mounted On Rubber

The floating platform is equipped with three separate rubber draft gears which absorb longitudinal shock, vastly reducing the need for blocking, according to Sergei Guins, assistant to C&O research director Ken Browne.

Cars are loaded from each end toward the center. When cargo is in place, U-bolts lock the movable stops tight against it. Car is suitable for either bundle or coil steel.

Less Damage, Lower Cost

The new gondola was built at C&O's car shops in Grand Rapids, Mich., with assistance from the road's Research Dept. Car has been placed in operation for test purposes only, according to Mr. Guins.

NEW C&O GONDOLA is loaded from the ends toward the middle. The two movable bulkheads quickly block sheets or coils, cut chances for damage.

Present system of nailed blocking and the new method of movable partitions for securing rolled or sheet steel are comparable in keeping damage down. New, movable-stop method is expected to be cheaper.

Truckers Seek Mail Contracts

Trucking industry spokesmen contend that the Post Office Dept. should switch mail-carrying contracts to motor carriers as a means of saving more than $85 million per year.

Deliveries would be expedited appreciably if trucks were given the job of hauling mail, the Independent Advisory Committee to the Trucking Industry says.

Over the years, rail service "has become a less and less efficient means of delivering the mails." It argues that railroads slow down the mail and increase costs by multiple handling, layovers, and missed connections.

Earnings:

Class I railroads netted $88 million in first quarter.

First quarter net income of the nation's 130 Class I railroads totaled an estimated $88 million after interest and rentals, according to the Assn. of American Railroads. This compares with $185 million for first quarter 1953.

Average rate of return for the 12 months ending Mar. 31 was 3.77 pct, down nearly 0.5 percentage point from the preceding year's 4.26 pct. This rate is calculated on earnings before interest and rentals and is based on average value of road and equipment at beginning and end of the period.

Class I Railroad Earnings

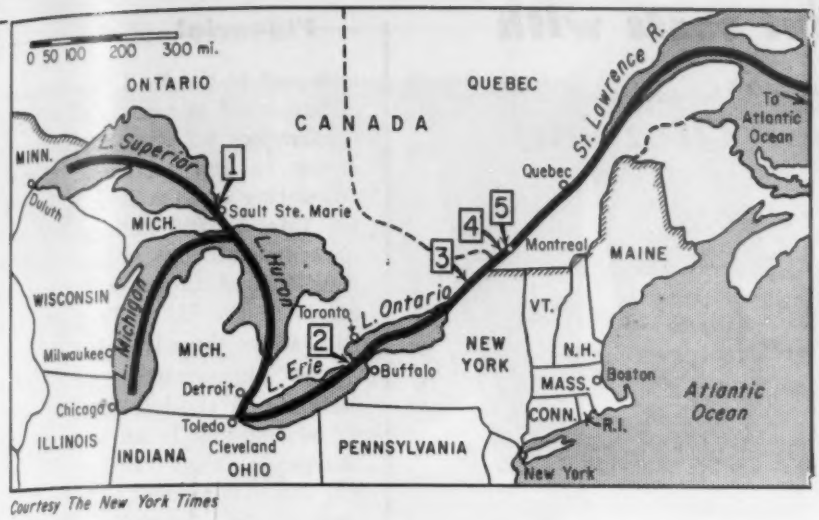
(Millions of dollars)

	1954		1953	
	March	First Quarter	March	First Quarter
Revenues	803	2274	920	2596
Expenses	630	1844	697	1980
Taxes	82	224	111	311
Net Income Before Charges	70	147	94	251
After Charges (Est.)	49	88	72	185

In the Eastern District, estimated net income after interest and rentals was $11 million for March, $9 million for first quarter. March 1953 net earnings totaled $22 million and first quarter 1953 net was $58 million.

Southern roads earned $11 million in March to boost first quarter net to $29 million. Comparable 1953 figures were $15 million and $39 million, respectively.

March earnings of western roads were $27 million, giving a first quarter total of $50 million. These compare with $35 million in March 1953 and $88 million in first quarter 1953.



Courtesy The New York Times

ST. LAWRENCE SEAWAY route as approved by Congress.

SEAWAY: Start Building This Summer

Beginning of actual construction expected in 60-90 days . . . Start both ship and hydro-power projects . . . Move Labrador ore to Midwest furnaces by cheaper, faster routes.

Actual construction of the St. Lawrence Seaway is expected to get underway within the next 60 to 90 days. An immediate start on both the navigational and hydro-electric power aspects of the project is anticipated in Washington.

President Eisenhower's approval this week of seaway legislation marks a major victory for midwestern industry, both in the U. S. and in Canada. Opening of Great Lakes ports to ocean-going ships will bring tremendous increases in both Lake and foreign shipping.

Since the discovery of iron ore in Labrador in 1950, both U. S. and Canadian steel interests have sought approval of seaway legislation by the U. S. Congress as a means of moving the ore to Great Lakes ports at low cost. The 365-mile railroad, extending from the ore fields to the port of Seven Islands, is now nearing completion.

Cheaper, Faster Route

The initial shipments of ore probably will be loaded into ocean-going freighters at Seven Islands and unloaded at the ports of Baltimore, Philadelphia, or New York and thence by rail to the steel mills. But with the opening of the St. Lawrence channel to the ports of Conneaut, Cleveland, Lorain, and Toledo, the ore will move at lower cost and in a much more direct route to the steel furnaces of the Midwest.

Government experts have estimated that if the U. S. had to depend entirely upon rail transport for its iron ore, the steel industry would eventually decline west of the Alleghenies with the depletion of the high-grade ores in the Lake Superior region. Ultimately the industry would be forced to move from its present centers of production. Opening of the St. Lawrence to ore-carrying navigation will have the effect of protecting the investment in the industries, homes and community facilities in the steel-producing areas of the Midwest.

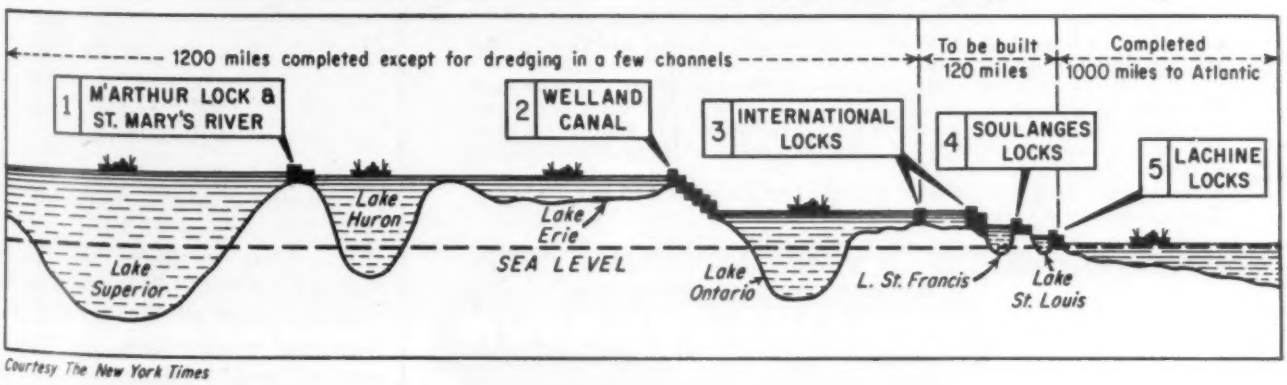
Mariners Fit Locks

Last year, Paley Commission (National Materials Policy) experts estimated potential annual supply from the Labrador ore fields during the period 1965-1975 at 40 million tons, of which half would be for the furnaces in the interior, best served via the St. Lawrence Seaway. And it is estimated that within 20 years, the tonnage from Seven Islands will run 20 million plus gross tons annually. In wartime, tonnages would be substantially higher.

U. S. Maritime Administration advises that the new class of streamlined *Mariner* ships, with a maximum draft of 29 ft, 9 in., can operate in the seaway to an average weight loading of 70 pct. Clearances of the locks, while close, are adequate to permit their passage to and from the Lakes.

From a point of view of cost, the seaway is planned to be self-liquidating. Estimated construc-

What's Being Done on the St. Lawrence Seaway



Courtesy The New York Times

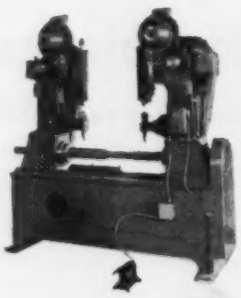
Save Labor... cut costs with

FASTER Riveting and Clinching!

T-J

RIVITORS

T-J RIVITOR used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.



DOUBLE RIVITOR sets two rivets at a time! Equipped with 10" hoppers, and tooled to automatically feed and set two ¼" dia. x ⅝" long wagon box head rivets at a time in elevator chain and raddle or elevator flight assemblies for farm implements. Controlled by one foot pedal.

CLINCHORS

T-J CLINCHOR... one of six special 8" throat Underfeed Clinchors used by a large automotive body manufacturer. Feeds and sets 11/16" square cased nuts in outside quarter panels, left and right hand.

DOUBLE CLINCHOR sets two nuts at once! Tooled to feed and set ¾" x ½" x 1/16" thick Fabri-Steel nuts at each operation. Both Clinchors tripped by same foot-operated valve. Adaptable to wide range of clinch nut setting problems.

Automatic Feeding and Setting!

T-J meets your needs for labor saving SPEED in assembly . . . with performance-proved Rivitors and Clinchors for many jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds.

T-J CLINCHORS set clinch nuts 3 to 5 times faster! Fully automatic . . . controlled by a single foot pedal! Available in Underfeed and Gravity feed models, throat depths 8" to 36".

T-J RIVITORS automatically feed and set solid rivets . . . with high production! Electrically powered Rivitor sets 1/16" to ¼" diam. solid steel rivets up to ⅞" long. Air-powered Rivitor sets aluminum alloy rivets up to ¼" diam. or steel rivets up to ⅛" diam. and up to ¾" long. Throat depths 8" to 36".

Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Co., Jackson, Mich.

38 YEARS EXPERIENCE T-J

TOMKINS-JOHNSON

RIVITORS . AIR AND HYDRAULIC CYLINDERS . CUTTERS . CLINCHORS

tion cost to the U. S. for the construction of the navigational improvements on the St. Lawrence comes to $88 million. Interest, amounting to $8 million, will bring the total to $96 million. A new government corporation—Seaway Development Corp.—will issue its bonds to the U. S. Treasury and will redeem them from toll charges.

One authoritative government estimate on the toll charges likely to be imposed is an average toll charge on cargo traffic of 29¢ per ton for a movement of 50 million tons; or 32½¢ for 45 million; or 36½¢ for 40 million cargo tons, not including any additional revenues from deadweight tonnages or ships returning empty.

Profits:

Steel net rose 33 pct in '53.
Manufacturing averaged 6 pct.

Iron and steel profits after taxes rose 33 pct last year as profits of all manufacturing corporations climbed 6 pct over 1952.

Total manufacturing profits before taxes were estimated in a joint report of SEC and FTC at $24.4 billion and $11.3 billion after taxes. This compares with $22.9 billion and $10.7 billion, respectively, the previous year. Sales by manufacturers reached an alltime high of $265.9 billion in 1953.

Profits for the first quarter of the current year, according to early reports to SEC, are comparable to the relatively high profits of the first quarter of 1953.

Although profits for the full year of 1953 increased, fourth quarter profits were lower than in the preceding quarter and lower than in the corresponding quarter of 1952. Eighteen of the total 23 industry groups showed increased profits for 1953. Lumber showed the largest decline, 18 pct.

For the year, manufacturing corporation assets increased to $171.2 billion, up $5.3 billion over 1952. Net working capital increased by $1.2 billion; net plant and equipment climbed by $4.1 billion and stockholders equity increased by $4.3 billion.

'Mill' Metal Chemically

Precisely controlled chemical etching replaces milling in a new process devised by North American Aviation, Inc. It won't make the machine shop obsolete but it does make some unconventional designs economically practical, says the aircraft firm.

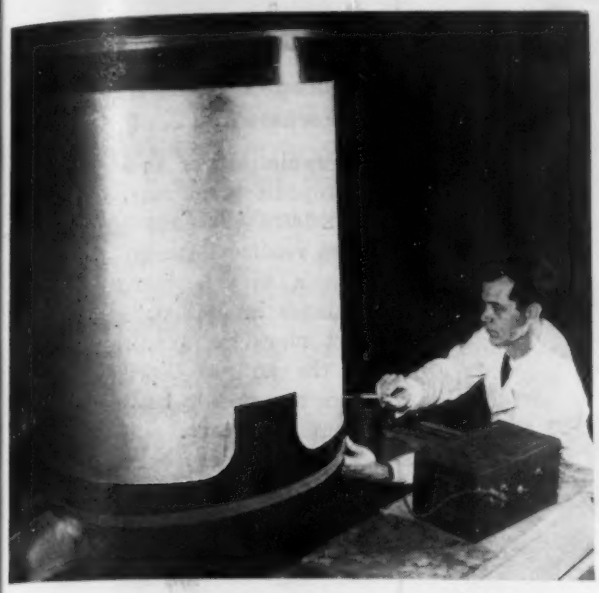
Essentially, the method consists of coating portions of a pre-formed part with an impervious substance and submerging it in an etching solution. The chemical bath eats away unwanted metal and the protective coating is removed. System is analogous with printed circuit production. Electronic controls provide a claimed accuracy of 0.002 in.

Report Cost Is Low

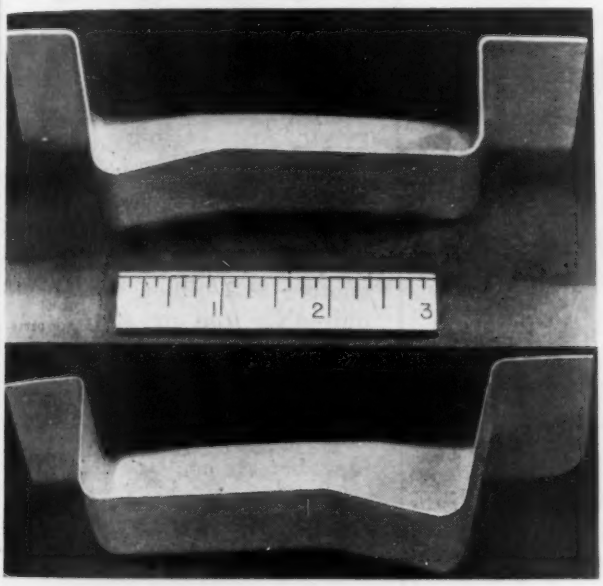
By this means, intricate or tapered "milling" can be performed on curved parts without many of the problems inherent in more conventional methods.

Experimentation has been done primarily with aluminum but it has also been applied to carbon and stainless steel, titanium and other metals as well.

Method is available under license from Turco Products, Inc., which developed the chemical solutions. Turco states that equipment cost is low and installation time is short.

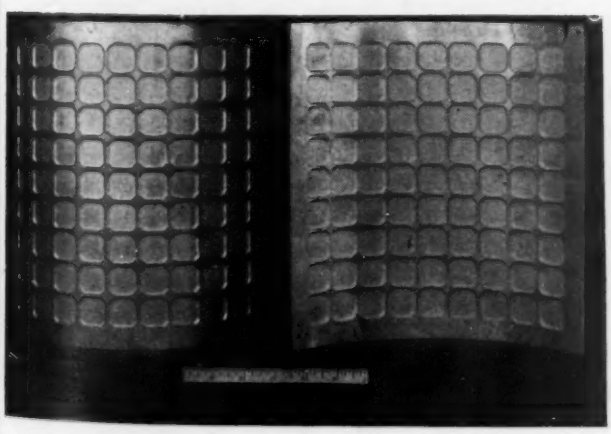


MIKING thickness of milled skin section after removal from bath. Dark area has protective coat.

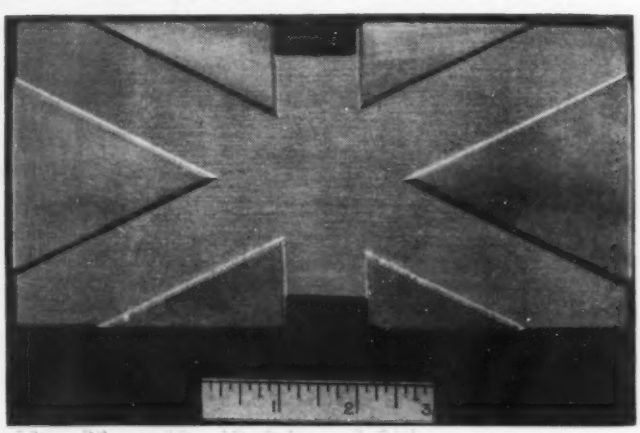


PART IS deep drawn of heavy-gage sheet to prevent cracking (above) then etched to desired thinness.

SPECIAL MASKING (on part at left) limits etching to desired area. Finished job is held at right.



WAFFLE section etched on convex, concave mating parts will be joined on lands for strong section.



FINISH, definition of angles should be noted. Grain probably indicates direction of rolling.

AIR IS OUR BUSINESS

FIFTY-TWO YEARS EXPERIENCE ENGINEERING AND MANUFACTURING VENTILATORS IS AVAILABLE TO YOU . . . ON REQUEST!

If you have a ventilating problem, Burt Engineers and case histories from thousands of time-tested Burt installations stand ready to help you. Burt holds no brief for any specific type of roof ventilator. The Burt line is complete—with a type and size for any need. If modified or special designs are required, Burt can design and fabricate them—economically.

•

If your problem is specific, give us the details. We'll recommend the solution. If it is general, write for the latest Burt catalog with data and descriptions of Burt's complete line.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

920 So. High St., Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

—International—

Steel:

Europe's domestic, export markets firm . . . U. S. loan.

Predictions of an upturn in the European steel market made by THE IRON AGE (Apr. 1, p. 77) have been realized. During April there was a sizable increase in new business in both domestic and export markets. Inquiries for steel at the end of April, early May were reported to be the highest in about 2½ years.

Some sources believe the U. S. might not have granted the European Coal Steel Community (ECSC) the recent $100 million loan had not the European steel market shown signs of firming. It appears, however, this money will be used mainly to develop coal, coke and iron ore production.

The U. S. loan is regarded by many as only a token payment to indicate general U. S. support of ECSC.

An ECSC spokesman has indicated that approximately $1.5 billion would be needed to modernize the Community's coal mines and another $1.2 billion would be required for iron and steel industry development.

Result is ECSC will now have to interest European investors. The time is right because money is easy, but the coal and steel industry has been holding off on issuing stocks until the U. S. loan had been granted.

It now seems safe to predict that during May, June and July a number of stocks and bonds will be issued to finance improvements needed in Europe's coal, iron and steel industries. It is expected that German, Belgian and French companies will be the most active in seeking new financing.

FREIGHT: Seek Steel Export Rate Cut

U. S. mills feel pressure of foreign mills here and abroad . . . Lower ocean rates, freight absorption help . . . Export prices still above foreigners' . . . Seek rail rate cuts.

A rehabilitated and business-hungry foreign steel industry is compounding the competitive woes of U. S. steel producers.

During the last 6 months, American mills have felt the sting of foreign competition both here and abroad. Foreign mills have been underselling us overseas despite rate reductions by ocean carriers and freight absorption by U. S. producers on steel for export. Foreign competition in the domestic market also is growing as foreign steel producers seek additional outlets for their products.

Set Rate Cut Hearings

In an effort to strengthen their competitive position in the world market, U. S. producers are laying down steel at North Atlantic ports at a delivered price reflecting the closest point of production to those ports. This has been supplemented by rate cuts by steamship companies.

Now, eastern railroads are being brought into the act in another move to swing the pendulum. A public hearing will be held in Buffalo May 18 before the General Freight Traffic Committee—Eastern Railroads on proposed rate cuts on steel for export. Proposed reductions range from 25 to 33 pct.

Boost Carload Minimums

Rate reductions to be discussed at the hearing would apply to export shipments from Pittsburgh, Johnstown, Wheeling, and Youngstown districts to New York, Philadelphia, and Baltimore ports. But other origins would be included when the new rates became effective.

Products affected would be finished steel, billets, and articles taking billet rates. No changes are proposed for pig iron, new steel rails, and steel cross ties. Carload minimum weights for finished steel would be increased from 45,000 to 50,000 lb. Billet minimum of 56,000 lb would be unchanged.

Export Freight Rates

Present and proposed export rates to New York on manufactured iron and steel:

(cents per 100 lb)

From	Present	Proposed
Pittsburgh	59.8¢	40¢
Wheeling	59.8	40
Youngstown	62.1	43
Johnstown	55.2	37
Buffalo	54.05	38
Cleveland	64.4	44
Canton	64.4	44
Mansfield	71.3	51
Detroit	71.3	51
Portsmouth	71.3	51
Middletown	75.9	54
Jackson, Mich.	78.2	57
Fort Wayne, Ind.	80.5	38
Kokomo	82.8	61
Chicago	86.25	63

With some exceptions, rates to Philadelphia and Baltimore are 2¢ and 3¢ under New York, respectively. Rates to other North Atlantic ports would reflect the usual port differential relationship. Proposed rates on billets and related articles reflect proposed rates on finished steel converted to net ton and applied to gross ton.

Imported Steel Prices

Base Prices Per 100 Lb Landed, Duty Paid

Size Extras Apply

	Northern East Coast	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate Grade, ASTM-A-305	$4.55	$4.55	$4.50	$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I Beams & Channels	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet & Plate, 10 & 11 Gage	5.50	5.50	5.45	5.78
Barbed Wire, per 82-lb net reel	5.40	5.40	5.40	5.63
Merchant Bars	4.55	4.55	4.50	4.83
Hot-Rolled Coils	4.70	4.70	4.65	4.98

* West Coast prices do not include $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Minimum Order: 50 Tons. Smaller quantities carry a handling fee of $30.00 to cover the expenses incurred in customs clearance, bills of lading and general import charges.

Set Selenium Export Registration

Third quarter exports of selenium may be registered with the U. S. Bureau of Foreign Commerce between June 16 and 30.

The dates apply to the following selenium commodities: powder (Schedule B No. 619159); metal, except selenium-bearing scrap materials (B No. 664998); salts and organic compounds (B No. 839750); salts and compounds, including selenium dioxide (B No. 839900); selenium-containing pigments (B No. 842900); accelerators composed of selenium-containing rubber compounding agents not of coal tar origin (B No. 829810), and ferroselenium (B No. 622098).

Set Aside Funds for Spain Buying

Federal funds totaling $2.3 million have been set aside for purchase by Spain of copper, nickel, aluminum and the products of these metals.

Stockpiles:

GSA reports status of strategic mineral buying program.

Columbium-tantalum deliveries being made under the government program for buying strategic materials are now making appreciable headway toward the goal of 15 million lb established in 1952.

Through the end of March, General Services Administration discloses in a new report, foreign and domestic deliveries amounted to nearly 4 million lb. Three agent companies and one federal agency are buying columbium in lots of at least 2000 lb and tantalum in lots of at least 1000 lb.

How They Stand

In addition, ores and concentrates are accepted in small lots at Custer, S. D.; Franklin, N. H.; and Spruce Pine, N. C. These depots also accept deliveries of mica and beryl for the government.

The GSA report shows, by commodity, the status of these buying programs as of March 31:

Tungsten—Deliveries total 781,733 short ton units (20 lb each), accepted at various milling points. Goal is 3 million units.

Manganese—Aggregate deliveries are more than 5 million long ton units (22.4 lb each) at depots in Butte and Philipsburg, Mont.; Deming, N. M.; and Wenden, Ariz.; and at rail points throughout the country. Complete goal includes 18 million units for the depots and 19 million for the rest of the country.

Chrome Ores — Deliveries amount to 53,088 long tons, accepted at the Grants Pass, Ore., depot. Purchase of 200,000 long tons has been authorized.

Mica—Depots have accepted 3,026 short tons toward a goal of 25,000 tons of hand-cobbed mica or the equivalent.

Beryl — Deliveries total 170 short tons. Amount authorized for purchase when the program opened in 1952 was 1500 tons.

Asbestos — Approximately 300 short tons of Crude No. 1 and No. 2 have been accepted at the Globe, Ariz., depot. Also accepted, but not included in the 1500-ton purchase program, were some 200 short tons of Crude No. 3.

New Airflow Boosts Jet Payload

Navy jet planes will be able to increase their capacity to carry rockets or bombs by 3000 lb when a newly-perfected system for controlling the flow of air over the wings has been installed.

This system was designed by a civilian aeronautical engineer in the Bureau of Aeronautics, John S. Attinello, of Falls Church, Va. (see cut). It is the product of more than 3 years of work in the boundary layer control field.

The system bleeds air from the jet engine through holes in the duct and forces it out at high speed over the trailing edge of the wing. This action tends to reduce turbulence in the area by making the normal flow of air hug the wing skin when the plane is at slow or near-stalling speeds.

Carrier-based planes will be especially benefited by the slower landing speed now permitted. Carrier tests involving use of the system are now in progress.

AWARD for jet research is presented to John S. Attinello by Rear Admiral Apollo Soucek.

Cut Defense Metal Setasides

Allocations of steel, copper and aluminum for "A" products—those needed for defense and atomic energy production—are reduced as much as 42 pct for the third quarter of 1954.

Office of Defense Mobilization hiked amounts of the three metals to be set aside at the mill level for "B" products to meet requirements for civilian type items incorporated in military end products.

Steel allotments for "A" products for the third quarter of the year are 43 pct below the second quarter, copper was reduced 36 pct and aluminum cut by 20 pct.

ODM allocated 742,271 short tons of steel for the third quarter; 42,528 tons of copper and brass alloys, and 57,279 tons of aluminum for "A" products.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Box, fiberboard, w/sleeves, 502500, $204,768, Kieckhefer Container Co., Camden, N. J.

Spare parts C-1114Q, Var, $52,987, Consolidated Photo Engravers Lithographers Eqpt. Co., Chicago, Ill.

Pole, tent, ridge type, 20000 ea, $133,400, Tucker Mfg. Co., Montgomery, Ala.

Bed, single wood Mirror, plateglass wood frame, 4389 ea, $84,590, Gravely Novelty Furn. Co., Inc., Ridgeway, Va.

Refrigerator 1027 ea, $107,054, Frigidaire Sales Co., Dayton, Ohio.

Refrigerator: mechanically cooled, 1027 ea, $104,117, R. Cooper, Jr., Inc., Chicago, Ill.

Deck balks, 1564, $249,560, J. S. Thorn Co., Philadelphia, Pa.

Shell, HE M329 MPTS for 4.2" Mortar, 712000, $5,005,360, Hardwicke-Etter Co., Sherman, Texas.

Brush rigging assy, brushes, bearing retaining rings, 27000 ea, $222,570, General Electric Co., Schenectady, N. Y.

Cabinet: electronic repair parts, alum, 16000 ea, $161,440, Stenod Mfg. Co., Newark, N. J.

Battery, dry, BA-236/U, BA-239/U, BA-242/U, BA-251/U, 32675 ea, $102,449, Burgess Battery Co., Freeport, Illinois.

Mast base, MP-65, 11295 ea, $85,412, J. & H. Smith Mfg. Co., New York.

Radiosonde, 20263 ea, $2,034,815, Standard Coil Products Co., Inc., Los Angeles, Calif.

Electron tube, 10000 ea, $140,900, Raytheon Mfg. Co., Newton, Mass.

Bucket, dredge, sq, nose, crane shovel 2 cu yd, 15 ea, $59,119, Yaun Mfg. Co., Inc., Baton Rouge, La.

Trainer & engr. data, 10 ea, $214,597, Link Aviation, Inc., Binghamton, N. Y.

Altimeter & spare parts, special tools PR 364464-Q, 400 ea, $139,548, Kollsman Instrument Corp., Elmhurst, N. Y.

Driftmeters, 38 ea, $133,590, Friden Calculating Machine Co., San Leandro, Calif.

Transmitter, 172 ea, $81,162, Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.

Spare parts, Lot, $73,280, Caterpillar Tractor Co., Peoria, Ill.

REPORT TO MANAGEMENT . .

USW a rougher customer

You can figure United Steelworkers will be a little rougher in the upcoming steel contract infighting than was previously anticipated. Reason is the steel industry's better-than-expected first quarter earnings report.

It's not entirely a coincidence that USW's wage policy committee which met last week to plot out union contract demands held off until after steel companies' earnings statements were in.

Earnings beat operations

USW may have suspected the companies fared better financially than the first quarter operating rate of 72.8 pct might indicate. Now it knows. Earnings were down 12.9 pct from last year's very good first quarter which means some of the steel companies aren't in bad shape at all.

Effect of the industry's reasonably good financial report will be to weaken the companies' stand somewhat, bolster the union hand slightly. Main argument against new union demands will be that the market's soft and that the companies can't afford to absorb increased costs (or risk a price increase to cover them). But steel companies will now have a harder time convincing union officials of this view.

What you can look for

You can look for USW to concentrate on a "package" deal with emphasis on increased pensions. The Iron Age estimates total cost will be 5¢-8¢ per hour; a price increase will be likely to follow.

Is your business dip over?

If your own business recession hasn't hit the level-off stage you're lagging the rest of the nation.

The President indicated how fast the economy's recovering at his press conference last week when he cautioned newsmen about overconfidence. Just a few weeks ago he was warning the same group about being overly optimistic.

You can't expect any sudden spurt in business, should even look for the usual slight summer slump, but we have reached the point where we can look back on the recession. And it's been a strange one.

Why this one's different

Running counter to usual recession trends were:

Prices, which unlike 1949, have remained fairly stable.

Plant and equipment expenditures--surveys have indicated business and industry plan to spend as much or more on expansion this year as they did in boom-bound '53.

Consumer disposable income in first quarter '54 was 3.7 billion higher than in same period last year, despite layoffs, increased unemployment. The January tax reduction was largely responsible for this.

Net income of corporations has held up. National City Bank survey of 570 leading corporations showed net income during first quarter '54 was 7 pct ahead of same period '53; only 4 pct less than in final quarter '53. End of excess profits tax was, of course, a major factor in this trend.

REPORT TO MANAGEMENT—REPORT TO MANAGEMENT—REPORT TO MANAGEMENT
UNIVERSITY OF MICHIGAN LIBRARIES

Industrial Briefs

Happy Birthday . . . ARMCO STEEL CORP.'s magazine for employees "Arm-co-operator" marked its 40th birthday last month. The magazine uses 40 tons of paper and a quarter ton of ink a year to maintain its international circulation of 26,000.

Service Started . . . Dr. Wilfred Eldred has started an economic analysis and consulting service at 315 Montgomery St., San Francisco.

Milwaukee Warehouse . . . ALLEGHENY LUDLUM STEEL CORP. opened a new tool steel warehouse and district sales office at 3800 N. First St., Milwaukee, earlier this month.

Chemical Progress Week . . . MANUFACTURING CHEMISTS' ASSN. is sponsoring Chemical Progress Week, May 17-22. Theme is "A Better America Through Chemical Progress."

Service Shop . . . ALLIS-CHALMERS MFG. CO., Milwaukee, has named the Virginia-Carolina Electrical Works, Inc., Norfolk, a certified service shop for its motors and controls in nine Virginia counties.

Open House . . . CRUCIBLE STEEL CO. OF AMERICA, officially opened its new branch sales office and warehouse building in Milwaukee, recently with a 2-day open house.

Elected . . . METAL POWDER ASSN., New York, elected Paul E. Weingart, American Metal Co., Ltd., president recently.

Celebrating . . . STEEL SUPPLY CO., Chicago, is celebrating its fiftieth anniversary this year.

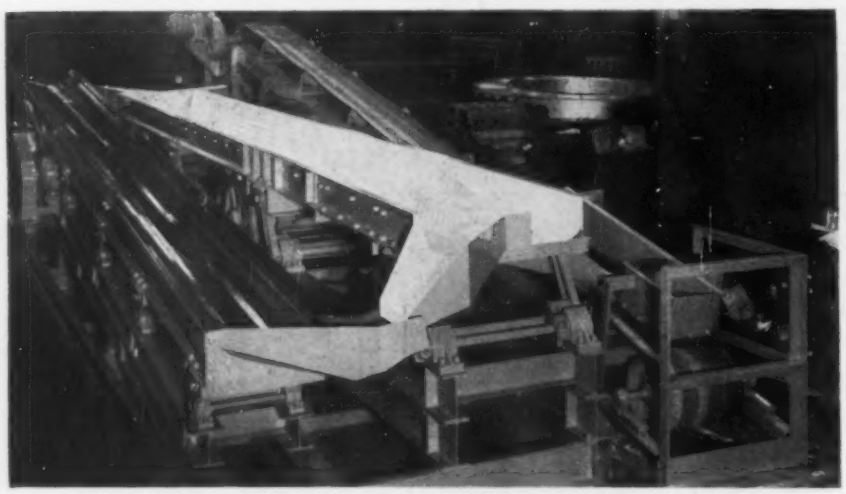
New Location . . . TRANE CO., La Crosse, Wis., has moved its Little Rock, Ark., sales office to a new location at Room 718, Pyramid Bldg. Rowe Hill is sales engineer in charge.

It's Official . . . RESERVE MINING CO.'s "taconite town" on the north shore of Lake Superior, 55 miles from Duluth, has a new post office address. Silver Bay, Minn., is the new mailing address.

New Prexy . . . AIR POLLUTION CONTROL ASSN. has elected Gordon P. Larson to the presidency of the national association.

Dividend . . . METAL & THERMIT CORP. declared a regular quarterly dividend of 50¢ per share payable June 10 to common stockholders of record June 1.

Appointed . . . PARKER APPLIANCE CO., Cleveland, has appointed Argo & Co., 7 S. West 18th St., Birmingham, as a distributor for Parker Hoze-Lok fittings and hose assemblies.



CASTINGS and sand handling system exhibit prepared by Link-Belt Co. for the 1954 Foundry Show in Cleveland this week weighs 20 tons. Exhibit includes two 25-ft oscillating conveyors and a 25-ft belt conveyor. As nearly as possible exhibit duplicates actual foundry conditions.

"Outstanding" . . . RADIO-ELECTRONICS - TELEVISION MANUFACTURERS ASSN.'s chairman of the board of directors, Robert C. Sprague, will be awarded the "Medal of Honor" for his outstanding contributions to the radio-electronics and television industry during the association's annual convention in Chicago in June.

Selected . . . ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago, has been selected as one of six colleges and universities that may be attended by the recipient of a $500 annual scholarship established by Maysteel Products Corp., Mayville, Wis.

Exclusive . . . AMERICAN CAR & FOUNDRY CO. appointed Shippers' Car Line Corp., a subsidiary, as its exclusive sales representative for the sale of ACF-built tank cars and tank car parts.

New Records . . . CONSOLIDATED ENGINEERING CORP. reports that sales and earnings for 1953 reached an all-time high. Sales totaled $14,074,063, and earnings were $510,406, highest in the company's history.

Scholarships . . . SHEFFIELD CORP. scholarships have been won by three students for entrance into Northeastern University, Boston, next fall. Loren E. Pratt, William R. Cokeley and John W. McCoy are the recipients of the awards.

Expanding . . . FERRO CORP. will further expand its Australian subsidiary, Ferro Enamels (Australia) Pty. Ltd., and has purchased another factory building in the vicinity of Sidney.

Receives Award . . . George N. Jeppson, chairman of the board, NORTON CO., Worcester, Mass., received the fifth annual Isaiah Thomas Award for distinguished community service from the Advertising Club of Worcester recently at a banquet attended by 500 New England business and industrial leaders.

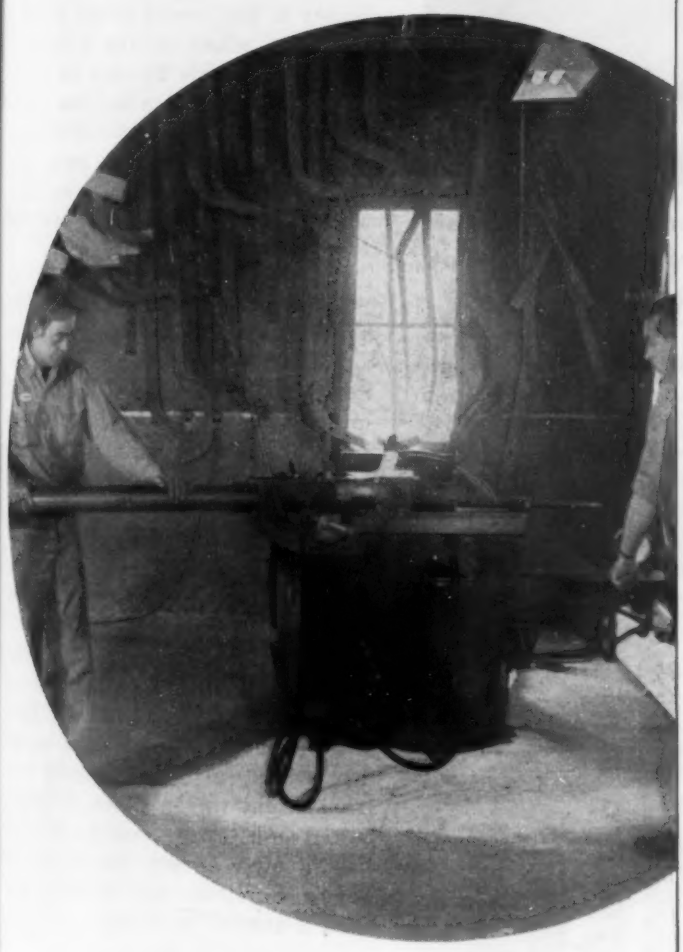
Any Bids? . . . WESTINGHOUSE ELECTRIC CORP., Pittsburgh, plans to take firm price bids for construction of an additional cooling pond and increased pumping facilities at its submarine thermal reactor site near Pittsburgh.

REVERE METALS

SERVE

Chris-Craft

STEM TO STERN



Bending a Revere Copper Tube for use in a Chris-Craft Cruiser. Revere Tube is also used in many Chris-Craft runabouts and utilities.

Chris-Craft cruisers are protected at the stem by brass stem bands; Revere supplies half-round extruded shapes for this decorative and protective application. At the stern or transom, copper exhaust tubes are just visible. There is a story behind these tubes, which have to be bent to shape with great accuracy, and without wrinkling. Chris-Craft Corporation's specifications are most exacting. The bending is done by a specialist, the Melville-Lee Co., located in Algonac, Mich., as is Chris-Craft. When Revere sought an order for the copper tube, the Technical Advisory Service was permitted to study Melville-Lee's equipment and methods, so our Methods Department at the mill could be thoroughly informed of the high quality requirements.

The tube required runs in sizes from 2" to 3½" OD. Use of copper tube reduces weight, while the corrosion-resisting qualities of copper make it durable and long lasting. Special standards of control over roundness, eccentricity and temper were set up in our mill, and production shipments have worked perfectly from the very beginning. No wrinkling or tearing has been encountered.

• • •

Revere Metals not only serve afloat, but in the air, under the sea, and on land, in almost every industry, including such diverse ones as the chemical, automotive, electrical and electronic, and in the home. Products include tube and pipe, rod and bar, sheet and plate, strip, extruded shapes, forgings, in copper and its alloys and aluminum alloys. Also Lockseam Tube electric welded steel tube. Get in touch with the nearest Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N.Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y. —Sales Offices in Principal Cities, Distributors Everywhere

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

SUN VALLEY club coupe is Mercury's transparent top car. Green-tinted plastic panel is built into top.

Want to See Through the Top

Transparent top is automakers latest achievement in effort to merge advantages of closed and open cars . . . How plexiglas tops are put in, tested—By *R. D. Raddant.*

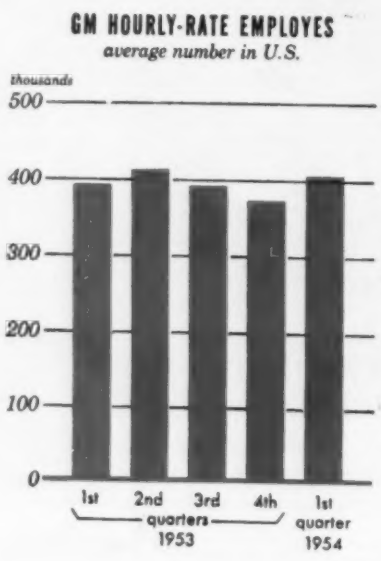
The first closed car had scarcely been developed when automotive engineers and stylists started looking for a combination that would merge the pleasures of an open ride with the comfort and safety from the elements provided by a conventional car.

This search has led to such developments as the old phaeton, the rumble seat, modern refinements of the convertible, and then the hardtop. The latter has probably enjoyed the most lasting success as a compromise between the sporty open car and the comfortable closed one.

This same search progressed another step this year with the introduction of transparent tops in Mercury's Sun Valley and Ford's Skyliner.

No Bubble Yet . . . These cars are still far removed from the aircraft plexiglas "bubble" top. But they are a big step in that direction with the entire forward half of the roof panel being replaced by an acrylic resin panel insert.

It's still uncertain whether the experiment will catch on and result in new refinements or continued extension of the transparent top until it is all plexiglas. But the cars are enjoying modest success and Ford and Mercury plants have midget assembly lines



where the plexiglas panels are put in.

Costs More . . . These extra steps, of course, cost money and add to the price of the car. The Sun Valley's suggested list price is $2365, or $121 over the comparable price of the Monterey hardtop. The Skyliner's suggested list price is $2043, or $102 more than the Victoria.

First extra operation on the Sun Valley is performed at the Buffalo stamping plant where a sizable hole, 50 in. wide by 35.5 in. long, has to be cut from a regular hardtop stamping. Also at the stamping plant, 28 anchor nuts are welded to the edges of the hole where the plexiglas insert will be attached.

It Scratches . . . Main problem in handling the methyl methacrylate top is that it scratches easily. Therefore, the inserts are first spraycoated with a plastic called Spraylat, which remains on the panel until final assembly is completed.

Body painting also requires extra work as a plastic mask has to be placed over the hole to prevent top paint from getting inside.

In the Mercury only, the rear window has to be installed before the plexiglas top is inserted. This is because the chrome side molding, which also helps hold the transparent top in place, must be bolted on after the rear glass is in.

This step is not necessary in Ford's Skyliner, which does not have a similar molding.

Lock It In . . . There is no special problem in attaching the plexiglas to the metal. It is placed in a rubber molding and seal rubber, set in place, and then the metal molding is attached from the outside to lock in the plexiglas.

Final step is a water test in

which a bath tub type fixture is lowered onto the plexiglas top and filled with water. This step may be discontinued as no failures have shown up in some time in spite of 100 pct inspection. However, if a leak should result, it would require the expensive replacement of interior top fittings.

All these operations occur on a four station miniature assembly line in a corner of the plant.

Only extra care required of the Sun Valley after it is swung onto the regular line is that a covering is thrown over the top to insulate the plexiglas from the intense heat if it should be necessary for the body to go through the paint ovens again. The protective plastic spray is also removed after assembly.

The transparent top requires a little special care from the owner and should not be wiped with a dry cloth.

Not Sure On Future . . . The future of transparent construction is still uncertain. The Sun Valley certainly provides a unique driving experience and is an eye-catcher. The tinted plexiglas minimizes light, glare and heat, although it may be a little warm and bright in a sustained drive under a blazing sun.

Automotive stylists are also working on sliding roof panels. Removable tops are already in the works for Ford's Thunderbird and Chevrolet's Corvette. These are future factors that the transparent top will have to compete with.

Uniform License Plates . . . Anyone who skinned his knuckles when trying to adjust his car's mounting fixtures to an odd-sized license plate will be glad to hear that a standard-sized plate may be attained by 1956.

This means a lot more to the industry than a few less curses from car owners. Auto manufacturers have already indicated that if a standard shape were adopted, they would take steps to integrate the license mounting into car design with some interesting styling results.

The American Assn. of Motor Vehicle Administrators is seriously pushing for a standard 6 x 12 in. license plate by that date. It requires bringing the 65 license jurisdictions of the U. S. and Canada into line in spite of state pride in unusual shapes and regional slogans that many affect.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
May 8, 1954..	132,365*	23,814*
May 1, 1954..	133,800	25,406
May 9, 1953..	149,075	30,546
May 2, 1953..	151,028	33,772

*Estimated. Source: *Ward's Reports*

Styling:

See proof new styling boosts sales . . . Pressure on in '55.

Production and sales results are beginning to show conclusively what most people in the auto industry have suspected for several months, that the stylists are in the saddle.

It is true that new engines are an important factor in the sales gains made by Ford and Mercury. But even more comparative strength is reflected in GM's restyled Oldsmobile, Buick and Cadillac.

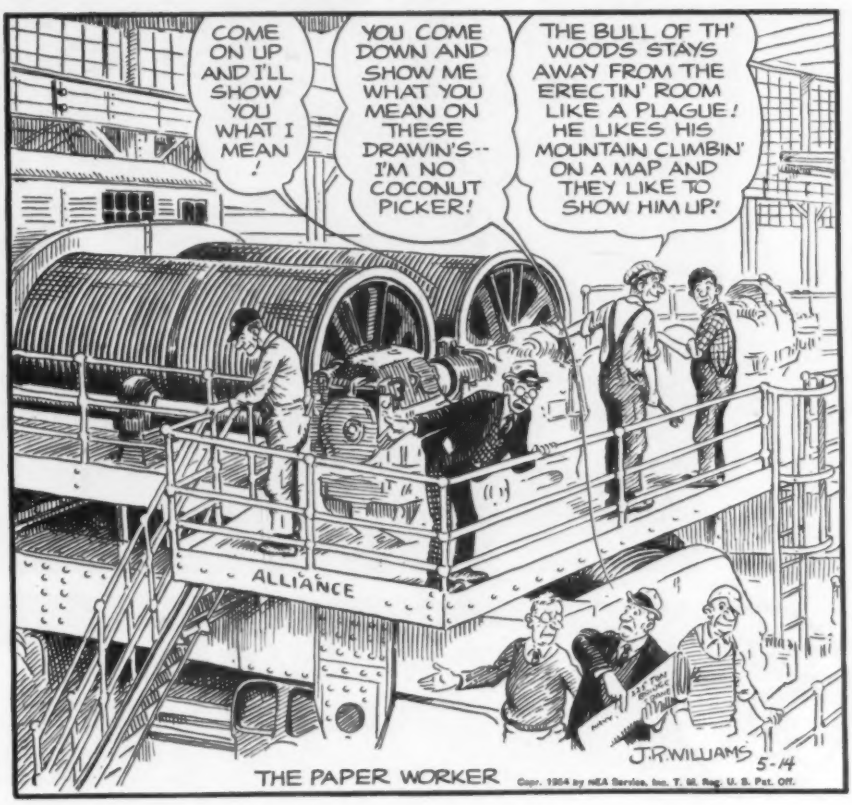
Buick has taken over third place in the industry and in April broke all its monthly production records with output of 54,836 cars against a previous monthly high of 54,164 registered in June, 1950.

Cadillac exceeded its April production of more than 12,500 units only in August of 1950. It is also significant that in a market where discounts are the rule, some Cadillacs were resold at $1200 over list earlier this year. Oldsmobile has shown production and sales gains similar to Cadillac and Buick.

Must Be Good in '55

This puts the heat on the stylists of automakers who are coming out with new stylings for 1955. While the successes pointed out here give them readymade competition, they also point to the results that can be obtained by a successful model.

THE BULL OF THE WOODS — By J. R. Williams


COME ON UP AND I'LL SHOW YOU WHAT I MEAN!
YOU COME DOWN AND SHOW ME WHAT YOU MEAN ON THESE DRAWIN'S-- I'M NO COCONUT PICKER!
THE BULL OF TH' WOODS STAYS AWAY FROM THE ERECTIN' ROOM LIKE A PLAGUE! HE LIKES HIS MOUNTAIN CLIMBIN' ON A MAP AND THEY LIKE TO SHOW HIM UP!
ALLIANCE
J.R.WILLIAMS 5-14
THE PAPER WORKER
Copr. 1954 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off.

HOW TO KEEP OIL CIRCULATING SYSTEMS CLEAN

OIL FILM BEARINGS on back-up rolls need the protection of a constant flow of rugged lubricant. *Texaco Regal Oil* is ideal for this service. It keeps oil lines clear and bearings clean for smoother operation, longer bearing life and lower maintenance costs.

Texaco Regal Oil is a heavy turbine-quality oil with high resistance to oxidation, emulsification and sludging. It separates rapidly from water that may work past the seals – keeps the system free from sludge.

For your enclosed reduction gears, use *Texaco Meropa Lubricant* – noted for its EP stability, its resistance to oxidation, thickening and foaming.

A Texaco Lubrication Engineer will be glad to show you how effective lubrication can increase efficiency and reduce costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

Blast Red Manganese-for-Food Hints

Some Administration experts aim at barter deal for Russian manganese . . . Soviet habit has been quick cut-off in times of U. S. need . . . Market now soft—By G. H. Baker.

Imports of Russian manganese may be in the offing.

Some Administration foreign-trade experts, beguiled by Russian hints of scarce materials in exchange for food products, are working quietly toward a barter deal that would include big-volume imports of manganese for the U. S.

What the policy planners prefer to ignore is that the low-cost (slave labor) imports of manganese will work to the detriment of the domestic manganese industry and eventually to the U. S. steel industry.

Present market for manganese is very quiet as a result of currently low steel operating rates.

Producers Fearful . . . Domestic producers, who turn out about 6.5 pct of the U. S. steel industry's manganese requirements, are fearful that the Federal Government once more is about to lend a naive ear to Russia's siren song of cheap and plentiful manganese. They are urging Washington defense mobilizers not to turn their backs on the small but vitally-important domestic industry.

India, South Africa and Brazil have become our biggest suppliers of manganese in recent years.

There's nothing basically new about the recent Russian hints of high quality manganese for sale or barter. Russia and her satellites have plenty of manganese—more than they can use. But the Reds have a long and treacherous record, dating back to 1927, of leading the U. S. down the garden path with respect to dependence upon manganese.

Cut Off Supply . . . Each time the U. S. has come to depend upon Russian manganese, the Reds have abruptly jerked the rug. Manganese shipments have been shut off abruptly and without notice. As a collateral development, U. S. mines—unable to compete on a cost basis—have gone to pot during each of these periods of Russian imports.

J. Carson Adkerson, president of the American Manganese Producers Assn., declares bluntly that the Reds are out to stop further development of U. S. manganese resources. And, he adds, the Administration's leaders are "swallowing it—hook, line, and sinker."

Although the General Services Administration is on the record as urging the extension of the stockpiling program to include the high-grade Virginia ores, ODM procrastinates and speaks instead of "the great improvement in the manganese situation." This, says Mr. Adkerson, is "a tragic example of delay and indecision within the ODM."

Air Raid Action . . . What business and industry should do prior to enemy air attack, and what it must do following attack, are outlined in a new government study on mobilization. Office of Defense Mobilization is issuing the report, which urges business—among other things—to secrete or destroy certain key records, duplicate others and ship the carbon copies to "safe" locations.

Predict Good Weather . . . Generally favorable weather during the next several weeks promises to boost retail sales in many areas. U. S. Weather Bureau's long-range forecast calls for drier-than-normal weather in most areas west of the continental divide. Rainfall will be above normal over a broad area comprising the Gulf states, the Mississippi and Ohio River valleys, and the Middle Atlantic states. In other areas, conditions will continue to be "about normal."

More Missile Money . . . New machinery and equipment that will speed the development of intercontinental guided missiles probably will be authorized by Congress within the next few weeks.

Lewis Flight Propulsion Laboratory probably is in line for the lion's share (about $3.5 million) of a $5 million money bill earmarked for guided missile research and development.

Work to be carried out at the Cleveland laboratory includes alteration of a supersonic wind tunnel, an air dryer for propulsion systems, an air heater for altitude test chambers, and a rocket engine research facility.

Larger facilities are needed to test today's advanced-design rockets, says Hugh L. Dryden, director of the National Advisory Committee for Aeronautics.

Export Help . . . Export-Import Bank plans to help American exporters of farm equipment meet competition supported by foreign governments.

Turn Page

Price Index Remains Steady

Consumer prices showed virtually no change from February to March. They rose only 0.2 pct according to a 10-city index computed by National Industrial Conference Board. It applies to moderate income families, covers food, housing, clothing, fuel, house furnishings and sundries on a weighted basis.

Based on January 1939, as 100, the March figure was 182.9. Comparative figures were: February 1954, 182.5; March 1953, 177.7. The dollar's purchasing power for March was 54.7¢.

ASK BAIRD ABOUT IT!

HIGH PRODUCTION TOOLING

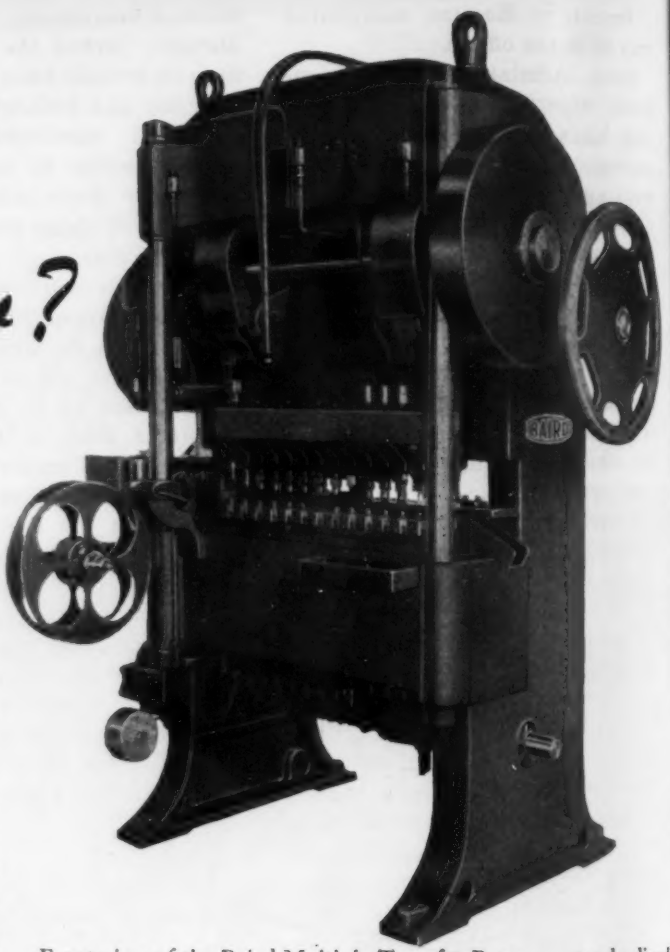
Biting off *More* than you can *Chew?*

Many types of small stamping machines can bite off coiled metal stock, but the BAIRD MULTIPLE TRANSFER PRESS cleverly chews each length into accurately formed products at the rate of thousands of pieces per hour.

Almost-human transfer fingers automatically grip and carry the work to progressive die stations where blanking, drawing, piercing, embossing, slitting, trimming, broaching, sizing, hexing, forming, etc., complete the piece.

Simply stated, the Transfer Press combines, in a single cycle, operations that otherwise might require several smaller machines with an operator for each. There are almost endless tooling possibilities . . . set-ups that turn out millions of small parts at extremely low cost.

An installation of Baird Multiple Transfer Presses puts the buyer in a most favorable competitive position in a buyer's market. Better "ask Baird about it!"



Front view of the Baird Multiple Transfer Press . . . standardized in 12 sizes with rated working pressures from 5 to 55 tons. Coiled stock from 2½" to 4" in width is automatically fed at high speeds.

SEND FOR TRANSFER PRESS BULLETIN

the BAIRD MACHINE COMPANY
STRATFORD • CONNECTICUT

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

Exporters complained to the Business and Defense Services Administration that the industry is being hurt because foreign competitors are offering advantageous long-term credits supported by their governments.

Export-Import Bank says a study now being completed will result in new procedures to meet the competition in sales to countries which are short of dollars.

But the bank emphasizes it will continue to assist in financing U. S. exports only on a selective basis.

Taft-Hartley:

Dissension in Senate kills all chance of revision in '54.

Taft-Hartley law stays as is.

Inability of the Senate last week to agree on proposed changes in the Taft-Hartley Act spells "no change" in the controversial labor law for the remainder of this year.

There is virtually no prospect that either the Senate or the House will press further at this session of Congress for amendment of Taft-Hartley, despite President Eisenhower's request for revision.

South Bars Passage

At the root of the Senate's inability to agree on the proposed amendments to Taft-Hartley is the fear of Southern Democrats that the bill went too far in the direction of banning race discrimination in employment, and the contention of some Republicans and many northern Democrats that the bill had the effect of surrendering an excessive degree of federal regulation of unions to the states.

Amendments sponsored by Senators Ives, R., N. Y., and Lehman, D., N. Y., would have added anti-discrimination riders to the conditions governing employment. These amendments were unacceptable to many Southern Democrats who favored an amendment sponsored by Senator Goldwater, R., Ariz., to restore some regulatory rights to the states. But the Southerners' fear of the Ives-Lehman proposals was greater than their desire for the changes backed by Senator Goldwater.

FTC Widens Consent Order Use

Firms named in Federal Trade Commission complaints now have a new and vastly-improved opportunity to avoid prolonged litigation, provided they agree to end—without further argument—any practices FTC says are illegal.

The commission, in an important series of amendments to its rules of practice, has made possible more widespread use of consent orders in all its litigated cases. Result should be a big reduction in expense and delay in the prosecution of all federal trade-regulation cases. Highlights of the revised consent order rule include:

1. Consent settlements need no longer contain findings of fact.

2. Cases now may be disposed of at any stage of the proceedings. Formerly, consent order could be entered into only prior to taking of evidence.

3. Cases now may be settled as to some or all of the issues or as to some or all of the respondents.

4. Hearing examiners now may accept or reject stipulations.

Highways:

New law boosts federal road-building aid to states.

Each state is to get about 50 pct more federal money for road construction in fiscal years 1956-57 than it is now receiving, under terms of the husky new federal aid to highways bill signed last week by President Eisenhower.

Use of $966 million a year is authorized for highway building in the 2-year period. As Mr. Eisenhower pointed out, this is the largest 2-year sum ever provided by the U. S. for the highway program.

Used as Matching Funds

In each year, $875 million will be apportioned to the states to be spent as matching funds for primary, secondary, and city road-building projects.

Of the remainder, $81 million a year will go into highways on federally-controlled lands, such as national forests, and $10 million annually will be used for the Inter-American Highway and the Rama Road, a Nicaraguan defense highway.

INFORMAL ALLIANCE of CIO Steelworkers, AFL Teamsters Union, UMW was formed at luncheon meeting recently by (l to r) Dave Beck, AFL; John L. Lewis, UMW; David McDonald, CIO. The union leaders want the government to start a spending program to relieve unemployment.

CRUCIBLE REXWELD hard surfacing rods increased forging die life OVER 400%

for R. G. LeTourneau, Inc.

By Rexwelding, R. G. LeTourneau, Inc., Longview, Texas, increased the life of its production dies over 400%. The dies shown, for example, used to forge a plug adapter of SAE 1030 steel at 2350 F, had to be removed from the press after forging 3100 pieces because of excessive wear and heat checking. The same die, after worn areas were machined out and faces built up with Rexweld-A hard surfacing rod, produced 9300 pieces.

You can do the same in your shop. You'll find that Rexwelded dies have higher edge strength at elevated temperatures, and resist chipping, deformation and heat checking better. And parts can be Rexwelded over and over.

So, use Rexweld Rods on your next hard surfacing application. They are available in both bare rods and low hydrogen coated electrodes, in a wide range of grades and sizes. Call your local Crucible representative — he can provide a grade of Rexweld adapted to your specific job.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking

REXWELD HARD SURFACING ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Bethlehem To Build Fabrication Shop

Locates new $4-$5 million plant south of Los Angeles . . . Will supplement firm's present outgrown works . . . Aim is to make Bethlehem tops in heavy fabrication—By *T. M. Rohan.*

Bethlehem Steel's recent announcement in New York of plans for a new $4-$5 million Los Angeles fabricating works marks that firm's determination to dent the western heavy construction market in a big way with local facilities.

Although always a major factor in western construction, Bethlehem-Pacific has in the past leaned heavily on eastern shops of the parent company for heavy bridgework main sections. The crowded Los Angeles fabrication works, located in a residential area and limited to one shift daily by local ordinance, has suffered heavy restrictions. Heaviest sections have been drilled and assembled in eastern plants, then transported west by ship.

U. S. Steel Shop . . . Major share of locally fabricated heavy section work has gone to U. S. Steel's Consolidated-Western Div. which can handle biggest jobs at its suburban Maywood plant. Structural members, however, are mostly a sideline to pipe and plate fabrication since multi-story construction is comparatively sparse in the West.

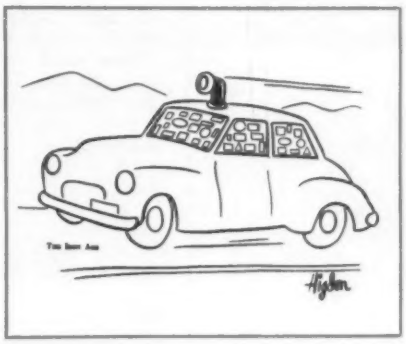
This shop was only western facility which could handle punching and sawing of heavy steel for the $62 million Richmond-San Raphael bridge now being built across San Francisco bay by Judson-Pacific-Murphy of Emeryville, Calif. So about 30 pct of tonnage was placed with this shop.

Judson-Pacific-Murphy is one of the leaders in Northern California in this type work. It uses outdoor jigs and portable cranes on a paved yard adjacent to the plant to assemble cut sections.

Bethlehem-Pacific has made its greatest strides in building construction and all-welded freeway overheads popular in California for their steel-saving features. Plate sections up to 16 tons were welded in the Alameda, Calif., shop near San Francisco for overpass sections in San Francisco.

Bethlehem-Pacific's Los Angeles shop was acquired in 1931. Among recent big jobs handled were the UCLA medical center, Tishman building (West's largest office building), new $20 million Schlitz brewery at Van Nuys and San Diego Power and Light's 400,000 kw Carlsbad, Calif., generating station.

Industry observers feel the new Bethlehem-Pacific plant might well be larger than the "50 pct bigger" indicated by Bethlehem Board Chairman Eugene Grace in the New York announcement. Although no authorization for start of the project has been made, a 50-acre plot of land was purchased early this year in Torrance, Calif. (south of Los Angeles) where the plant will undoubtedly be located. The present plant occupies eight acres and employs 150. It is located about five miles from the recently modernized all-electric steel mill.



New Can Plant . . . A new can-making plant for the lush Northern California fruit and vegetable industry was in the works last week. Robert S. Solinsky, president, and Andrew Toft, vice president of the National Can Co., Chicago, were in the area shopping for a plant site.

One plant for fruits and vegetable cans is to be built for initial operation by January or February, 1955, and eventually the firm's whole line, including beer and soft drink cans, may be introduced. Mr. Solinsky indicated he hoped to choose a site within 30 days. Other California areas are also under consideration as well as Pacific Northwest.

Titanium Increase . . . Sponge output at Titanium Metals Corp., Henderson, Nev., is now up to six tons daily from four a year ago. By July it should hit 10 tons, Clark W. King, Allegheney Ludlum vice president said in St. Louis last week. In Henderson where details of a $10 million expansion have been kept under close wraps, some outdoor process equipment has been erected. The expansion was to have been principally in purifying equipment.

New Phoenix Plant . . . A favorable climate in both air and taxes brought a new $1.5 million aircraft plant to Phoenix last week. Babb Aircraft Co., Inc., an Atlas Corp. subsidiary, announced its headquarters for propeller and engine overhaul and airplane and parts warehousing will be operating in three months.

Babb will be the city's first national firm with headquarters there. Machine shops and warehousing facilities will be moved from Seattle and Glendale, Calif., but other national operations will remain unchanged.

Major inducements reported were exemption from inventory tax on shipments to out of state points, lower building costs.

When profits decline... bring costs in line with Kearney & Trecker's TOOL-LEASE PROGRAM

New Kearney & Trecker milling machines and precision boring machines...available for leasing... can help improve your competitive position and PROFITS

TOOL-LEASE — A COMMON-SENSE APPROACH TO PLANT MODERNIZATION

Kearney & Trecker's Tool-Lease Program offers operating management a way to stop the trend of rising costs, increasing competition and shrinking profit margins. With Tool-Lease, you can enjoy optimum flexibility to meet changing production requirements while avoiding the risk of high obsolescence. What's more, Tool-Lease provides a way to keep your plant modern without tying up working capital.

TOOL-LEASE OFFERS A CHOICE OF PLANS TO MEET INDIVIDUAL NEEDS

Under Tool-Lease, you can rent any of the standard Kearney & Trecker *knee or bed type milling machines or precision boring machines*. All are available under three basic plans, with varying options to continue or terminate the lease or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

TOOL LEASE
KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS
EQUIPMENT ®

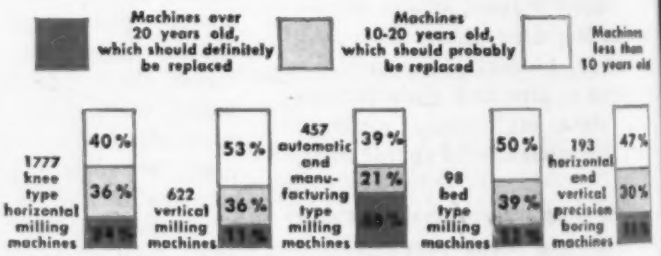
©1954

GET ALL THE FACTS NOW

For complete details on Tool-Lease... help in analyzing your milling and/or precision boring needs — see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

MACHINE TOOL OBSOLESCENCE IS BECOMING CRITICAL! WHERE DO YOU STAND?

Here's the picture in a typical basic industry — CONSTRUCTION, MINING & OIL WELL EQUIPMENT — (see chart below). Of the 3300 standard knee type horizontal, vertical, bed and manufacturing type milling machines and precision boring machines in use today — *which could be replaced by Tool-Lease* equipment — 33% are 10-20 years old, 23½% are more than 20 years old!



Kearney & Trecker Corporation
6784 W. National Ave., Milwaukee 14, Wis.

Please send me Bulletin TL-10A with details on the Tool-Lease Program or call Milwaukee, GReenfield 6-8300.

Name.....

Title.....

Company.....

Address.....

City.....Zone.....State.....

Circle Automotive As Main Tool Market

For near term auto industry is best market . . . Trend toward V-8's, automatic transmissions, power accessories is reason . . . Vance Plan troubles—By *E. J. Egan, Jr.*

Is your business a likely prospect for additional or replacement machine tools. If it is, you've probably had a sample of vigorous machine tool salesmanship recently. And from here on it appears that builders are going to convert the sample into a full-scale, industry-wide campaign.

Members of the National Machine Tool Builders' Assn. took a close look at the current business picture last week at their annual spring meeting in Chicago.

What's the Outlook . . . NMTBA President Herbert L. Tigges told the builders they could look for:

(1) Continuing high level of manufacturing activity throughout the country.

(2) The largest accumulation of obsolete machine tools in the nation's history.

(3) Enough competition among potential customers to make them extremely cost-conscious.

(4) Greatly diminished but fairly continuous defense business.

(5) Better understanding throughout government of the industry's problems.

Tell Berna, general manager of NMTBA, said the automobile industry is the top machine tool prospect for the near term. In his opinion, machine tool expenditures by automakers are likely to be higher in 1954 than in 1953.

As evidence, Mr. Berna cited the present trend toward new V-8 engines, more automatic transmissions, more power brakes, steering and other power-driven accessories.

He rated the balance of the metalworking industry a close second to the automotive group for potential machine tool sales. But the degree to which this large modernization and replacement potential can be realized is something else again. It will take plenty of hard selling, and it also depends to some extent on forthcoming tax legislation.

May Ease Depreciation . . . Liberalized depreciation schedules and proposals to benefit capital equipment buyers are now pending in Congress. Reports from Washington indicate the Senate Finance Committee now studying these measures may approve even more liberal terms than those already passed by the House.

If these faster writeoff provisions are finally written into law, machine tool salesmen will still have to persuade their prospects to take action. "Congress may open the door to more constructive replacement programs," Mr. Berna said, "but sales engineers must understand depreciation in order to discuss the new policy with their customers."

Less Than Predicted . . . The NMTBA official said that machine tool defense orders are coming in at the low rate of about $4 million a month. This is far below recent Washington predictions that defense spending would total between $250 to $620 million through June of this year.

The Defense Dept. can't seem to get going on a firm program to buy necessary machine tools for a broader mobilization base. The appropriation of $250 million to get the Vance Plan underway hasn't been used in fiscal 1953 or 1954. The sum was carried over to the Dept.'s budget for 1955, but the House Appropriations Committee removed it, assuming there was no real need for it.

Machine tool builders don't want to see the Vance Plan go down the drain this way, hope the Senate will be able to restore the money to the Defense Dept.

But they also hope to see the Defense Dept. come up with an orderly, intelligent plan to spend its machine tool appropriations. They don't want to get involved in a deadline rush to spend money for machine tools. They feel any such move would be unwise and inevitably followed by large scale cancellations. This would waste time, put builders to a lot of unwanted expense.

New Officers of the American Society of Tool Engineers

J. P. Crosby, President

H. B. Osborn, Jr., 1st Vice-President

H. C. McMillen, 2nd Vice-President

H. E. Collins, 3rd Vice-President

W. Ewing, Secretary

R. C. Peterson, Treasurer

"where can I get a good, small general purpose hydraulic press... *quickly?*"

"HANNIFIN HAS THEM FROM 1 TO 10 TONS FOR PROMPT DELIVERY!"

Yes, Hannifin is your best source for small, general purpose hydraulic presses. And, you can get *almost* immediate delivery because the demand for these popular presses is so consistent that Hannifin is able to make them in quantity.

This *continuous* quantity production works to your advantage price-wise, too, because the savings of volume production are passed along.

The quality of these small presses is identical to that of the larger Hannifin presses that are built to order. Fast acting, single-lever and dual-lever manual controls are standard, but optional controls, including Hannifin's patented Sensitive Pressure Controls, are available on the 5-, 8- and 10-ton models. Maximum pressure can be adjusted from 10% of capacity to full capacity on all models.

select the press you need from this chart...

CAPACITY, tons	1-ton	2-ton	5-ton	8-ton	10-ton
MODEL NUMBER	F-10	F-20	F-50	F-80	F-101
RAM SPEED (in.–min.) Down	400	190	120*	73*	130
RAM SPEED (in.–min.) Up	800	345	240*	151*	254
PUMP (gpm.)	3.3	3.3	5*	5*	11
MOTOR (hp)	1½	1½	2*	2*	5
STROKE (in.)	6	6	10	10	12
GAP (in.)	10	10	16	16	22
REACH (in.)	6	6	7½	7½	10
BULLETIN	H-784	H-784	135	135	134

Supplied with larger motor and pump when higher ram speed is required.

PRICES WILL BE SENT PROMPTLY ON REQUEST

Check ✓ THE BULLETINS YOU WANT ON THE COUPON

mail the coupon!

Hannifin Representatives Are at Your Service In These Leading Industrial Centers

Atlanta, Buffalo, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Houston, Los Angeles, Milwaukee, Minneapolis, Moline, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Seattle, Richmond, Va.; Rochester, N. Y.; South Bend, Ind.; Washington, D. C.; Worcester, Mass. In Canada: TEM Sales Company, Ltd., Toronto and Windsor.

HANNIFIN

Hydraulic and Pneumatic Presses from ½ Ton to 150 Tons
Air and Hydraulic Cylinders • Riveters • Air Control Valves

Hannifin Corporation
1113 S. Kilbourn Ave., Chicago 24, Ill.
Please send bulletins checked, together with prices:

☐ Bulletin H-784 ☐ Bulletin 135 ☐ Bulletin 134

Name.....
Position.....
Company.....
Address.....
City.....*State*.....

The Iron Age

SALUTES

Walter H. Wiewel

His ability to get things done never clashes with his unfailing consideration for others.

ONE of the first lessons Walter Wiewel learned in the steel business was the value of good organization. He never forgot it.

When he joined Crucible Steel Co. six years ago he put it to work, just as he had done in earlier years with other steel companies and during the war while serving with the War Production Board.

As Crucible's vice-president in charge of sales, Walter lost no time installing a program of training for all sales personnel, including office workers whose only contact with customers is by telephone. The course, a continuous one for about nine months of the year, is one of the most intensive and comprehensive in the industry.

With it all, Walter is no brow-beater—never was, in fact. Two of the traits most often mentioned by those who know him are his "essential kindness and consideration" toward everybody, including the office boy, and his ability to get things done. On both points, they readily cite chapter and verse.

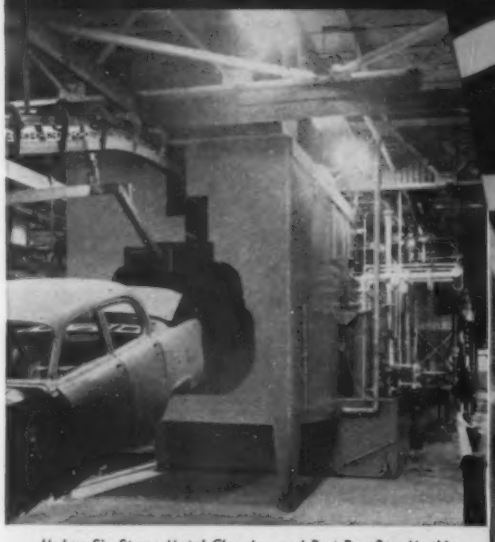
Born and educated in Cleveland, Walter was assistant general manager of sales at Jones & Laughlin from 1935 to 1944. After leaving WPB he joined National Tube as assistant to the president. In 1947 he went to Trent Tube Co., joined Crucible when it acquired Trent as a wholly-owned subsidiary in 1948. He is president of Trent.

In earlier years, Walter was with Timken Steel & Tube Co., United Alloy Steel Corp., and Standard Seamless Tube Co.

For relaxation Walter turns to serious music and sports. He is a director of Pittsburgh Opera, Inc., and when he puts his mind to it shoots golf in the 70s. He also likes to bowl and fish, and is not averse to a friendly game of pool, either.

COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH



Mahon Six-Stage Metal Cleaning and Rust Proofing Machine. Note Modern Fire-Jet Heating Units on solution tanks.

One of three Mahon Dry-Off Ovens and one of five Mahon Cooling Tunnels in this Complete Mahon Finishing System.

Mahon floor conveyor type Finish Baking Oven in the two-tone and repair line—part of the same Complete Mahon System.

Interior of one of the four Mahon Down-Draft Hydro-Filter Spray Booths in this Complete Mahon Automobile Body Finishing System. Note adjustable Diffusers in ceiling for better air circulation control within the booth.

MORE AUTOMOBILES are FINISHED in COMPLETE MAHON FINISHING SYSTEMS than ALL OTHERS COMBINED!

Illustrated here is another Complete Mahon Finishing System installed for one of the world's largest producers of fine automobiles. Embodied in this system are all the latest developments in equipment of this type . . . it combines all the major units of equipment and other essential facilities into an efficient, smooth running production processing system which turns out the ultimate in fine finish. If you have a finishing problem, or are contemplating new finishing equipment, you, like thousands of other alert manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning, co-ordinating and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time—a factor which should be carefully considered when comparing initial cost figures. Mahon will do the complete job on one contract . . . undivided responsibility for the entire system safeguards you against complications which may upset your production plans and subsequent schedules. See Sweet's Plant Engineering File for information, or write for Catalog A-654.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

The Iron Age

INTRODUCES

Frank E. Hines, named executive vice-president and director of engineering, BALDWIN-LIMA-HAMILTON CORP., Philadelphia; **Haskell Ginns,** appointed vice-president in charge of electronics; and **Edgar J. Jones,** appointed vice-president in charge of sales.

R. F. Allen, elected vice-president, H. K. PORTER CO., Pittsburgh.

E. J. Tribble, named assistant vice-president in charge of manufacturing, Harrison Works, WORTHINGTON CORP.; **A. M. Tullo,** becomes works manager; and **L. E. Hammer,** named works manager, Wellsville headquarters, New York.

Edgar F. Whitmore, Jr., appointed assistant vice-president, Shippers' Car Line Corp., subsidiary of AMERICAN CAR & FOUNDRY CO.; **John P. Krumech,** appointed vice-president in charge of sales; and **Robert S. Slater,** appointed vice-president.

Walter J. Maytham, elected vice-president, WESTINGHOUSE ELECTRIC CORP.; and **William B. Anderson,** named assistant to vice-president and general manager of consumer products, **J. M. McKibbin.**

George E. Whitlock, named vice-chairman of the board, MULLINS MFG. CORP., Warren, Ohio. Mr. Whitlock had erroneously been reported as chairman of the board in this column. **Henry A. Roemer,** was re-elected as chairman.

Howard A. Acheson, Jr., appointed assistant to executive vice-president, ACHESON INDUSTRIES, INC., New York.

Francis S. Gregory, elected assistant secretary, ATLANTIC STEEL CO., Atlanta.

Sam Laud, becomes vice-chairman, GENERAL AMERICAN TRANSPORTATION CORP., Chicago; **William J. Stebler,** named president; **Herman Altschul,** becomes vice-president in charge of freight car sales; and **James S. Frey,** elected vice-president-manufcturing.

Lawrence E. Moore, elected secretary-treasurer, Colonial Steel Div., VANADIUM-ALLOYS STEEL CO., Latrobe, Pa.

Henry J. Erisman, named assistant secretary in charge of production costs, production scheduling and inventory control, DEWALT, INC., Lancaster, Pa.

James S. Fidler, elected secretary, REVERE COPPER & BRASS, INC., New York.

A. B. Drastrup, executive vice-president, elected a member of the board of directors, A. M. BYERS CO., Pittsburgh.

G. E. Burks, appointed director of engineering and research, CATERPILLAR TRACTOR CO., Peoria.

Carl J. Oxford, elected to board of directors, NATIONAL TWIST DRILL & TOOL CO., Rochester, Mich.

William L. Mitchell, appointed director of GM styling section, GENERAL MOTORS CORP., Detroit.

John H. Castle, Jr., elected director of the PFAUDLER CO., Rochester, N. Y.

C. G. Eschenbach, appointed director of employment and employee services, CHRYSLER CORP., Detroit, succeeding V. E. Blue, who is retiring.

Iver C. Johnson, appointed Chicago area field engineer, Powdered Metal Products Div., YALE & TOWNE MFG. CO., Franklin Park, Ill.

THOMAS E. MILLSOP, named president, National Steel Corp., Weirton, W. Va.

W. W. HOPWOOD, becomes president, Hagan Corp., Pittsburgh.

HENRY S. WINGATE, elected president, The International Nickel Co. of Canada, Ltd.

Personnel

Maxwell R. Warden, elected a member of the board of directors, THE BULLARD CO., Bridgeport, Conn.

Eugene G. Gwyer, appointed sales engineer, Michigan-Ohio area, HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Andrew M. Toft and **Mervin B. France,** elected to the board of directors, NATIONAL CAN CORP.

H. E. McConahay, appointed superintendent of material control section, ALLIS-CHALMERS MANUFACTURING CO., Milwaukee; and **L. E. Worley** named superintendent scheduling section; and **J. E. Brinkmann,** named assistant superintendent scheduling section.

Dr. J. P. Milionis, joins New Product Development Dept., AMERICAN CYANIMID CO., New York.

Dewey E. Sibbles, named office manager, Mobile Works, Ala., ALUMINUM CO. OF AMERICA, Pittsburgh; and **William C. Johnston,** named office manager, Bauxite Works.

C. A. Brashares, appointed general sales manager, HARBISON-WALKER REFRACTORIES CO.

Stanley R. Hood, named general manager, new Thermostat Metal Div., AMERICAN SILVER CO., INC.

Robert M. Simpson, named assistant manager, CRUCIBLE STEEL COMPANY OF AMERICA, San Francisco sales branch.

James G. Wray, appointed manager, CONTINENTAL CAN CO., Syracuse Machine Plant.

William E. Julian, made general manager, MIDWEST PRECISION CASTINGS CO., Cleveland.

George T. Fraser, appointed western sales manager, REM-CRU TITANIUM, INC., Midland, Pa.; and **Dwight W. Kaufmann,** appointed eastern sales manager.

Gordon Dille, named manager of public relations, Lamp Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

RODNEY C. GOTT, named executive vice-president, American Machine & Foundry Co., New York.

H. A. DENNY, appointed vice-president and assistant general manager, Engineering and Construction Div., Koppers Co., Inc., Pittsburgh.

JOSEPH T. FOERTH, elected vice-president, Bassick Co., Bridgeport, Conn., subsidiary of Stewart-Warner Corp., Chicago.

RAYMOND B. KROPP, elected chairman of the board and chief executive officer, Kropp Forge Co., Chicago.

1 man
...handles
Sheet Steel
Faster, Easier
with a
C-F LIFTER
C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method — and at lower cost per ton. Wide carrying angles hold sheets securely — won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.
Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.
CULLEN-FRIESTEDT CO.
1303 SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS

HERE'S PROOF: You can always count on Continental for every fastener need!

Phillips "Bits—Holders—Screws" are Exclusive with Continental!

...they can cut your production costs

Continental is the only manufacturer producing this outstanding Phillips fastening combination—bits, holders, and screws. Their development has finally made power driving really practical, even on finished parts.

They have cut fastening costs as much as 50% and Continental's HY-PRO-Phillips bits average 2 to 4 times longer life than any other . . . one actually drove over 1,000,000 screws. Yes, it's another Continental exclusive in an outstanding record of 50 years in business.

Put your fastening needs in experienced hands. Call direct today or contact your local distributor. Continental can help cut your production costs.

Manufacturers of **HOLTITE** Fastenings

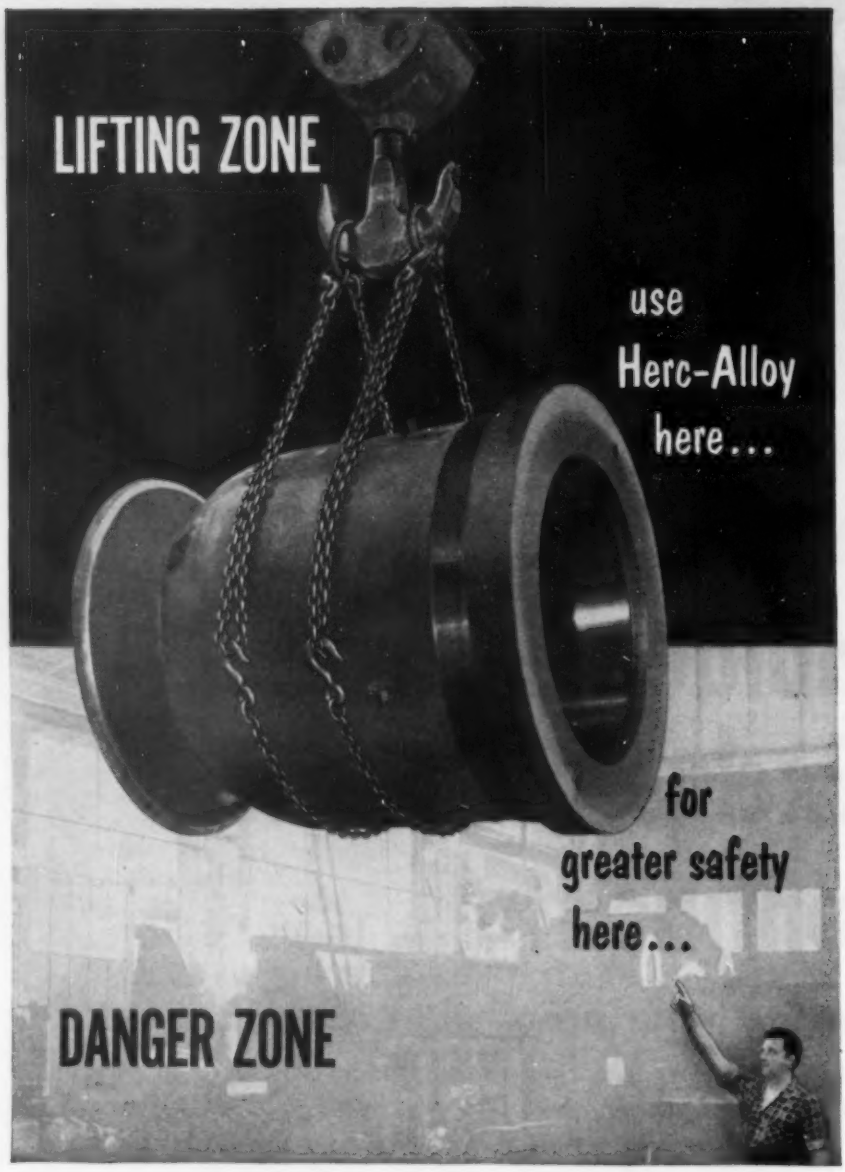
CONTINENTAL SCREW COMPANY INC. 1904

50th Anniversary

CONTINENTAL SCREW COMPANY

New Bedford, Mass., U. S. A.

UNIVERSITY OF MICHIGAN LIBRARIES



SPECIFY

HERC-ALLOY

SLING CHAINS

Write for Data Book

HERC-ALLOY
Sling Chains are made-up to order, are individually tested, registered and guaranteed.

Hundreds of plants like the one shown above* are using Herc-Alloy Sling Chains. Greater safety is their big reason for doing it. But there are other factors too. Herc-Alloy is economical because of its long service life. Then too, the use of alloy steel permits a weight reduction that helps prevent worker fatigue. These advantages are worth thinking about. Those who do consider them seriously generally adopt safe Herc-Alloy Sling Chains for their plants.

*LAKE ERIE ENGINEERING CORPORATION — MANUFACTURER OF HYDRAULIC PRESSES

CM HOISTS AND CHAIN

COLUMBUS McKINNON

CHAIN CORPORATION

TONAWANDA, NEW YORK

DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND

Personnel

Continued

H. F. Devens, appointed assistant to general manager, Metals Div., OLIN INDUSTRIES, INC.; and **E. W. Sherman,** named assistant sales manager.

Paul M. Offill, Sr., appointed general sales consultant, GEO. P. REINTJES CO., Kansas City.

John S. Collbran, Jr., named western district sales manager, Chicago office, THE NEW JERSEY ZINC SALES CO.

O. S. Stocker, joins Sales Dept., Electroplating Div., UNITED CHROMIUM, INC., New York.

Robert G. Roy, appointed general manager, Gary Screw & Bolt Div., PITTSBURGH SCREW & BOLT CORP.; **Robert Lowery, III,** named assistant general manager; **William N. Hoelzel,** becomes general manager of sales; and **John C. Jewett,** appointed assistant general manager of sales.

Robert A. Johnson, named New York district sales manager. Meter & Valve Div., ROCKWELL MFG. CO.

A. M. Guthrie, named assistant sales manager, Findlay Div., GAR WOOD INDUSTRIES, INC., Wayne, Ind.

J. B. Call, named production manager, Akron Steel Products Plant, FIRESTONE STEEL PRODUCTS CO., Ohio; and **D. E. Oldham,** appointed chief production engineer.

Walter A. Mazan, joins Industrial Dept. service staff, WYANDOTTE CHEMICALS CORP., Wyandotte, Mich.

Edward Ireland, transferred to central New York marketing area, Follansbee Metals, division of FOLLANSBEE STEEL CORP.

James W. Jones, becomes district representative, THE COOPER ALLOY FOUNDRY CO., Hillside, N. J.

Robert A. Foley, appointed salesman, Chicago district office, LINDBERG ENGINEERING CO.

Jack E. Davis, becomes plant manager, COLSON CORP., Elyria, Ohio.

Cramer Gilmore, promoted to superintendent, Seamless Hot Mills, Allenport, Pa., works, PITTSBURGH STEEL CORP.; **Leonard T. Lucas,** promoted to finishing department electrical foreman; and **William A. Moffat,** becomes electrical foreman, Blast Furnace Dept.

The Iron Age
FOUNDED 1855
Technical Articles

Predetermines soundness—

Ultrasonic Testing Lowers Forging Production Costs

By R. N. Hafemeister,
Foreman
Non-Destructive Test Section
Inspection Dept.
Allis-Chalmers Mfg. Co.
Milwaukee

◆ Cost savings in the manufacture of forgings can be obtained through the use of ultrasonic tests for determining ingot soundness before forging . . . Test is rapid, reliable and inexpensive . . . At Allis-Chalmers, about 50 ingots, ranging from 70-in. octagon to 42-in. ingots have been tested ultrasonically with good results.

◆ Sonic test data are used as an aid to position forgings in the ingot, check ingot soundness and predetermine forging procedures . . . In extreme cases, an ingot can be scrapped before any forging is done . . . Success of an ultrasonic testing program requires close cooperation among forge shop superintendent, metallurgist and supervisor of sonic testing.

◆ ULTRASONIC TESTING of medium and large-sized forging ingots can offer considerable cost saving benefits to the forging industry. Properly applied, these tests are rapid, reliable and inexpensive. At Allis-Chalmers Mfg. Co., ultrasonic tests are used as an aid to (a) position forgings in the ingot, (b) control top and bottom crop, (c) study heating practice, (d) check ingot soundness and (e) predetermine forging procedures.

For best results, the forge shop superintendent, metallurgist and supervisor of sonic testing should be familiar with each others work and problems. In this way, they can intelligently test, interpret and decide what action should be taken. If such a program is followed lower costs in the production of heavy forgings can be achieved. Success of the sonic testing program at Allis-Chalmers has been such that plans are now being made to extend it to all ingots regardless of size.

Tests were first made on standard 64-in. octagon ingots conditioned by the supplier to withstand cooling and reheating cycles necessary for production.

Surface preparation for the test is as follows: At each of the test points, the surface is prepared by grinding an area approximately 4-in. in diam. All scale or other foreign material is removed from the surface, which is ground

UNIVERSITY OF MICHIGAN LIBRARIES

After proper testing, it is comparatively easy to predict troubles which might arise in forging a specific ingot . . .

flat to permit good crystal contact. A heavy-bodied cylinder oil acts as a satisfactory couplant between the crystal and the metal surface. Allis-Chalmers is now working on a more rapid method of surface preparation. Ingot tests are made with a type UR Sperry Reflectoscope using a frequency of 0.5 MC.

All forgings are made under close control using the best forging practices possible, so that any defects which might arise could be traced to ingot rather than forging conditions. Ultrasonic as well as bore inspection of all forgings is made prior to and following heat treatment. This system of cross testing makes it possible to predict the reaction of any forging to subsequent handling by knowing the condition of the ingot it was forged from. Secondary piping, for example, leads invariably to forging difficulties, and in some cases, to scrap forgings.

After proper testing, it is possible to predict the troubles, if any, which might arise in forging a specific ingot. This is comparatively easy if the accuracy of the test is relied upon. Implicit faith in the instrument is a prime requisite for prediction of results from this test.

Procedure standardized

About 50 ingots, varying in size from a 70-in. octagon, to a 42-in. ingot, in both alloy and plain carbon analysis, have been examined in the last 2 years. Allis-Chalmers was able to use a standard procedure set up to sonically examine the ingot. Several ingots, however, required additional regrinding of the surface or a slight variation of the testing technique.

Various problems and conditions that arise, are shown in the following study of 64, 54 and 48-in. octagon ingots. All three ingots were made by the same manufacturer and received the same treatment prior to shipment. The chemical analysis of the three ingots was the same, i.e., medium carbon ingots with alloy additions, although various analyses do not affect sonic testing.

Fig. 1 shows the trace on the cathode-ray screen from the hot top area of the 54-in. ingot. The bottom area was also tested. The prominent back reflection with minor indications between the initial pulse and back reflection show this to be a sound ingot with no evidence of porosity or secondary pipe. This ingot was forged in the normal manner and produced a sonically sound forging.

Test aids in predicting

The 64-in. ingot was scheduled to produce a large forged shaft. It was sonically tested to determine its internal condition. Fig. 2 shows one of the test traces on the cathode-ray screen. Center porosity and secondary pipe were observed. It was decided to forge, but maintain a close watch at all times. Forging reductions were normal, i.e., a minimum of 2.6 to 1 and the heating and cooling cycles were very closely controlled. Trouble was encountered during forging due to a rather large 8- to 10-in. long, transverse crack which opened up about 28 to 30 in. from the step down at the hot top. This crack was cone shaped and of undetermined depth. After cropping the hot top, approximately 6 in. of the cone remained in the forging. A double upsetting was performed to obtain good consolidation.

After forging, the shaft was given a regular protection heat cycle and annealed prior to the first rough machining operation. After rough machining, the shaft was given a flash cut so that another ultrasonic test could be made. Fig. 3 shows one sonic test taken 27 in. from the main body in the arm of the finished shaft.

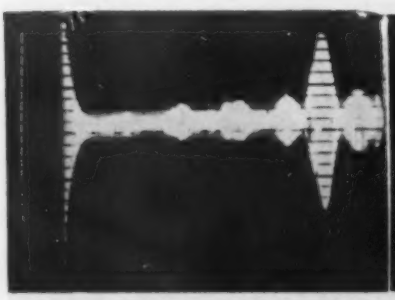


Fig. 1—Prominent back reflection indicates 54-in. ingot is sound and free from porosity.

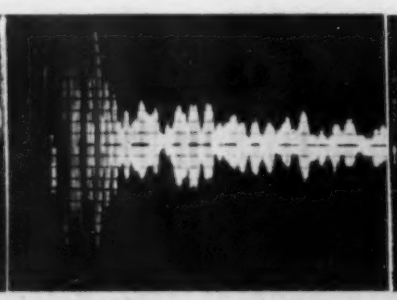


Fig. 2—Center porosity and secondary pipe were found from tests on the 64-in. ingot.

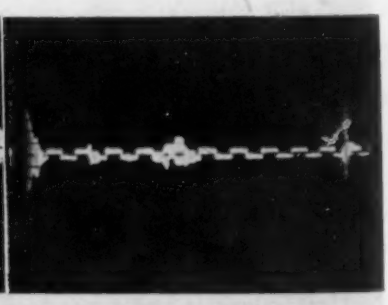


Fig. 3—Sonic test taken 27 in. from main body in arm of finished shaft from 64-in. ingot.

Benefits and Limits of Sonic Testing Program

The forging industry has long felt the need of a rapid and reliable means of predetermining the soundness of ingots used for numerous medium and large-sized press forgings.

If the head blacksmith knows of the existence and location of secondary pipe, or loose or porous center, the forging procedure can be modified accordingly. Also, if it could be practically possible to predict the soundness of a forging from the soundness of the ingot, a considerable amount of money could be saved. Scrap forgings could be reduced due to changes in forging procedures and in extreme cases the ingot could be scrapped before any forging is done.

Until fairly recently, there were two obstacles confronting such a program. They were a reliable method of testing and the availability of ingots for testing.

The first obstacle was overcome by progress made in the field of ultrasonic testing. The second doesn't apply at Allis-Chalmers since the company purchases all forging ingots and therefore has a supply of properly thermal-conditioned ingots available.

Main barrier to ultrasonic testing in many plants is that ingots after casting and stripping, are held in soaking pits at an elevated temperature until needed. They then go directly from the pits to forge furnaces. Nowhere in this procedure are the ingots cold enough to be tested.

Thermal conditioning, or cooling the ingot, reduces the grain size somewhat and also presents an opportunity for ultrasonic testing. It is also possible to stop the forging process at any point for the purpose of cooling and ultrasonically testing as a check on any heating program, since by controlling important variables in the forging procedure it is possible to predict the soundness of a forging.

A 3-in. bore was put in the shaft to explore and give visible proof of the sonic test. In addition to a considerable amount of open porosity, from pin-head size to ¼ in. in diam, one large forging burst was found. The burst, as revealed by the 3-in. diam bore, was about 2½-in. wide, and extended more than 3 in. transversely from the outside diameter of the bore.

Ultrasonic exploration of the burst and porous area indicated the final bore would have to be at least 5½ in. in diam in the arm, with a bottle bore of 15 in. to remove the burst. A forging of such low quality is always scrapped. It was later cut up and the above measurements were confirmed.

Results of ultrasonic tests on the 48-in. octagon ingot show how prior knowledge of the internal condition of the ingot can be used to advantage in altering the forging procedure to produce a sound forging. Some results of the sonic test at various locations on the 48-in. octagon ingot is shown in Figs. 4 and 5.

There were no indications of a major secondary pipe in this case, but there was extreme center porosity. The shaft scheduled for this

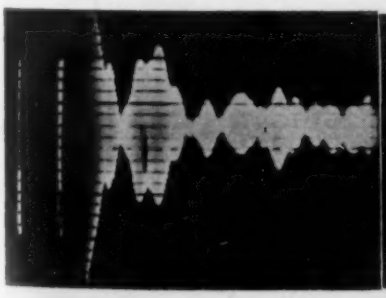


Fig. 4—Extreme center porosity was indicated by test on 48-in. ingot, 20 in. from top.

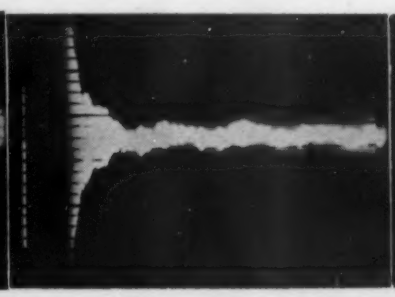


Fig. 5—Test trace on same 48-in. ingot, as in Fig. 4, taken 21 in. from bottom of ingot.

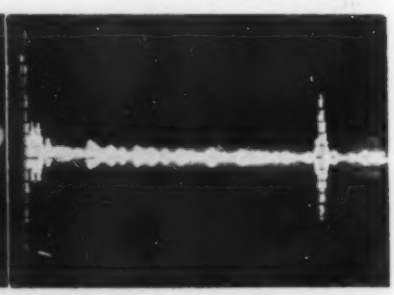


Fig. 6—Trace, 30 in. from chuck hold of 65-in. bloom, indicates minimum center condition.

Certain flaws in an ingot do not necessarily reject it from use for a scheduled job, but changes in forging procedure may be required . . .

ingot fortunately had dimensions that allowed large forging reductions to be made.

After a careful study of the ingot condition it was decided to use the ingot for the job scheduled, but with changes in the forging procedure. The ingot was given a single upsetting operation with a total forging reduction of 3.5 to 1 through the diameter of the largest section. It was thought that sufficient consolidation of the center would take place so that possibly a 2- to 3-in. bore would remove any residual center condition.

Pattern reveals soundness

After the equalization and thermal protection heat treating cycles, the forging was rough turned. A flash cut with a flat nosed tool followed. The finish resulting from this machining operation was approximately 90 microinches. The shaft was then tested 100 pct ultrasonically both transversely and longitudinally at 2.25 megacycles frequency. There were no significant sonic indications present in the shaft and it was approved for use without boring.

Work was recently completed at Allis-Chalmers on the sonic testing of large forged blooms and the forgings which were made from them. A total of 10 blooms, 8 of them reduced from 76-in. ingots to 65-in. octagons, and two of them reduced from 76-in. ingots to 55-in. blooms, were used. These reductions were made by an outside supplier using a 2800-ton press. The ingots were not allowed to cool before forging. The blooms, however, were given a thermal conditioning treatment prior to shipment and the sonic test was made just prior to reheating for forging.

One of several sonic patterns obtained from one of the 65-in. blooms is shown in Fig. 6. There is little or no indication of any center condition and the bloom was approved for the job scheduled. After forging, the bloom was again subjected to sonic inspection and approval was given for use in the solid condition. Boring for periscope inspection was not necessary.

Another sonic pattern, of several obtained from one of the 55-in. diam blooms, is shown in Fig. 7. This bloom had been reduced from the top portion of a 76-in. ingot. Like the others it was forged on a 2800-ton press and the ingot was kept hot between casting, stripping and forging. It was then thermal conditioned by the supplier and shipped to the plant. Reflectograms showed residual pipes and a bad center condition.

In view of the sonic pattern it was decided to use only the best portions of the bloom where a reduction of the order of 3.5 to 1 could be obtained. Although the complete report on the forging is not yet available, considerable trouble both in forging and in the sonic test of the finished part had been encountered.

Aids entire industry

By way of contrast it is interesting to note Fig. 8. It shows the sonic pattern obtained from the 55-in. bloom made from the bottom portions of the above mentioned ingot. Although a slight residual center condition can be noted, there is no evidence of secondary pipe. The finished part under sonic testing showed a center condition of approximately 2 in. in diam which was subsequently removed by boring.

If properly applied, ultrasonic testing can be of vast help to the forging industry. Encouraging results have also been obtained by correlating ultrasonic and radiographic inspection.

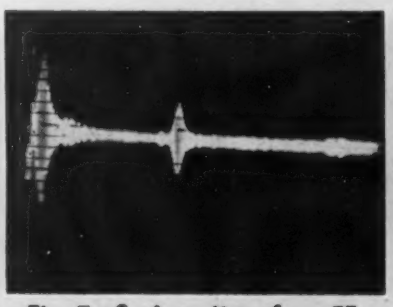


Fig. 7—Sonic pattern from 55-in. bloom produced from the top portion of 76-in. ingot.

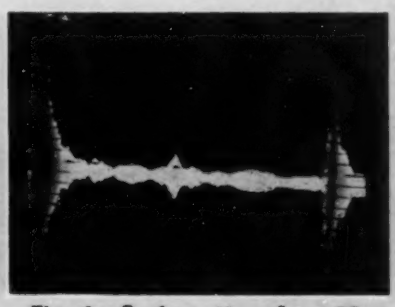


Fig. 8—Sonic pattern from 55-in. bloom made from bottom portion of the same 76-in. ingot.

Better Properties Extend Uses for Porcelain Enamels

By W. A. Barrows
President
Barrows Porcelain Co.
Cincinnati

◆ Extended usage of porcelain enamels in industry is attributed to new techniques and frit compositions . . . Many problems involving heat, corrosion, thermal shock and other service conditions are being solved . . . In almost every case, savings are substantial.

◆ On cold-rolled steel, coatings stand repeated shocking from 1000° to —60°F . . . Industrial enamels resist sulfuric and muriatic acids . . . Some resist almost every acid except hydrofluoric . . . Special enamels have been developed for hot water tanks.

◆ NEW TECHNIQUES and frit compositions have greatly expanded the number of applications for porcelain enamels in industry. The high-temperature coatings, originally promoted in large part by the jet engine program, are being improved both in their essential characteristics and in methods of application. Their use is solving many problems where other materials fail because of heat, corrosion, thermal shock or other adverse service conditions.

Porcelain enamels can be divided roughly into two broad groups. One group is used at temperatures up to 1400°F. The other group, the high-temperature ceramics, is used at temperatures from 1400° to 2000°F. This latter group is solving many corrosion and heat problems, and in practically every case results in a saving.

It is difficult to define the maximum high-temperature limits of a glass coating. In some cases, the maximum limit exceeds the softening point. A ceramic material does not go through a definite chemical or structural change at any given temperature. At room temperatures, it appears hard. As the temperature increases, its hardness lessens. It then becomes moderately soft, then quite viscous and, at extreme temperatures, approaches the liquid stage. At no point is there a definite change in physical character as occurs with water at freezing and boiling points.

In defining high temperature, it is sometimes necessary to know how high and for how long. The normal working limit in a jet engine application is about 150 hr. In contrast, the operating life of a piece of chemical equipment might be several years. A glass coating in a highly viscous state may be perfectly satisfactory for high-temperature gases but unsuitable where solids contact the coating.

Ordinary enamel softens at about 800°F. A particular high-temperature enamel used on

ENAMEL COATING on combustion chamber for drop drier increases efficiency, improves heat transfer, prevents corrosion due to weathering.

UNIVERSITY OF MICHIGAN LIBRARIES

cold-rolled steel softens at about 1200°F and has a maximum temperature of about 1400°F. High-temperature ceramics for stainless steel will soften near 1400°F and their maximum operating temperature is 1800°F. In excess of 2000°F, ceramic coatings are of so little value in extending the life of parts that their use is economically impractical. However, some coatings have shown improved condition at 2300°F.

Welding introduces certain considerations in selecting metals for high-temperature applications. Only types 321 or 347 stainless steels should be used when welding is involved since both are stabilized alloys. If a non-stabilized stainless steel is welded, high temperatures may cause failure at the weld area under certain conditions.

Hardenability of certain metals and alloys may be effected during application of a ceramic coating or in high-temperature use. This factor should be considered when selecting base metals for ceramic coatings.

The 300-series austenitic stainless steels are usually hardenable by cold working. Their hardenability is not affected by subsequent temperature applications.

Application of heat can affect the grain structure of the 400-series martensitic stainless steels. These steels are age-hardenable and may fail at high temperatures. The chrome ferretic steels, types 405, 430, 442 and 446, are not hardenable.

Enamels resist most acids

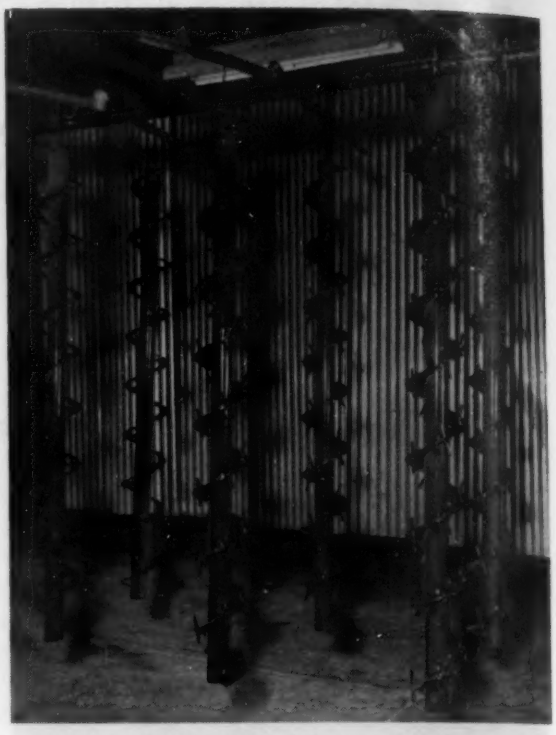
Acid resistance of porcelain enamels refers to retention of gloss after exposure to mild acids such as 10-pct citric or 10-pct oxalic acid. Industrial enamels are proof against sulfuric acid and muriatic acid. Some resist practically every acid except hydrofluoric.

Many porcelain enamels have very good resistance to caustic solutions at room temperatures. Some will stand up for several days or weeks under 15 pct caustic solution at 212°F.

Special glasses have been developed for hot water tanks. Peculiarly, hot water is an extremely corrosive material. Many glasses with high acid resistance are not particularly suitable for hot water tank application.

Continuity of coating is an important factor. The coating must be continuous over all surfaces. Where various types of metal, complicated shapes and weld areas are needed, it is very difficult to avoid minute pin holes. Such defects are of no consequence where weathering, corrosive gases, or high temperatures are involved but can be a source of failure if corrosive liquids are used.

Surface characteristics are hard to define.



PARTS VARYING in thickness are tough to coat. These conveyor screws were coated successfully by preheating a few times to equalize heat.

Porcelain enamel surfaces are usually described as being glassy smooth. They form a poor base for paints and adhesives because of their extreme smoothness. Most porcelain enamels have a slight orange peel appearance due to spraying. Careful spraying can minimize this characteristic.

Electrical characteristics of porcelain are usually defined as having a potential of 1000 v per 0.001 in. of thickness. This is an optimum reading, and any slight defect, thin spot or inclusion of a metallic imperfection reduces this value appreciably. It is probably not safe to design for a potential of more than 100 or 200 v per 0.001 in. of thickness. Surface resistance is similar to most any other glass surface but not quite as good as glazes on electrical porcelain.

A high-temperature porcelain enamel can be made in practically any color. It may have a full gloss with high reflectance or an extreme matte. It can be speckled, stippled or have any combination of colors. Special-purpose industrial glasses often have drab nondescript colors.

Hardness of glass coatings is often between 4 to 6 on the Mohs scale. This is about 500 Bhn or 51 Rc.

Thermal shock characteristics vary considerably with the type of glass used. Ordinary enamels generally withstand thermal shock from well above boiling to cold water. High-temperature coatings on cold-rolled steel stand repeated shocking from about 1000° to —60°F.

In jet engines, coatings on stainless steel stand immediate thermal shocking from 1800° to —60°F without failure.

Mechanical shock properties are hard to define since there is no measure. In general, mechanical shock-resisting values are an inverse ratio to the coating thickness. Ordinary finishes run from 0.008 to 0.020 in. thick. High-temperature finishes on cold-rolled steel are 0.003 to 0.004 in. and high-temperature ceramics on stainless are from 0.001 to 0.0015 in. A rough rule is that the coating must hold intact up to the yield point of the metal base. With some very thin coatings on thin metal, it is possible to go beyond this point.

Minor details important

Reflectance of a super white porcelain enamel, one-coat finish, about 0.008 in. thick, ranges from 82 to 86 pct. The emissivity factor is about 77.4 as compared with 4.0 for aluminum and 15.8 for stainless steel. This factor is important in heating units or heat exchangers where the coating gives protection against corrosive gases without interfering with heat transfer.

Raw materials for ceramic coatings have wide availability. Costs and supply problems with scarce and expensive metals and alloys are considerably lessened. Certain frits costing $2 per lb are the exceptions since most frits cost about 15¢ per lb. Even these expensive mixtures more than justify their use because they are applied in thin films, greatly increase the life of parts and reduce maintenance costs.

Sometimes a relatively minor detail precludes successful use of the coating material. An improper weld may prevent coating. Faulty major design may also be costly and time consuming.

Cost of the finished piece often depends on the base metal. The best base metal is enameling iron. Cold-rolled steel is also a good base material. Stainless steels, with or without nickel, can also be coated. Aluminum can be coated in certain cases. As a rule, nonferrous metals should not be used. Galvanized or zinc-coated metals cannot be used since they preclude cleaning.

In enameling, metal must first be cleaned for good adherence of the coating. Two methods are used—sandblasting and pickling. Sandblasting is more expensive but it is the only method for cleaning cast iron and stainless steel, and certain complicated cold-rolled steel assemblies.

A half dome made of enameling iron having a 4-ft diam is considered the ideal design for enameling. It can be sprayed more easily with liquid enamel and it provides for good adherence. The curved metal also offers better strength than a flat piece. A large radius bend will give a better base surface for the coating than a sharp bend.

Smooth, gas-free welds needed

A single, self-contained piece offers the best surface for coating. If welds are necessary, they should be smooth, gas-free and of the same base metal or made with specifically formulated arc rod.

Coatings cannot be applied over brass, brass welds, or bronze due to lack of adherence. They cannot be applied over silver solder or parts that move like hinges or pins.

Riveted pieces can be coated only under limited conditions. A light-gage flat piece with a heavy stiffening angle welded to it cannot be

LINED TUBING for air heater outages has practically eliminated failures due to corrosion. Tubing is made in 21-ft lengths and up to 3-in. diam at rate of 1800 ft per shift to suit many needs.

UNIVERSITY OF MICHIGAN LIBRARIES

Parts of varying thickness can be enameled by proper heating . . .

coated satisfactorily because of unequal expansion and contraction during welding.

Gas or electric welds are satisfactory. In light-gage assemblies, spot welding is often used for attaching clips or lugs. These fasteners should be of lighter gage than the base metal. When two pieces are joined by spot welding, the spots should be spaced very closely to simulate a seam weld. Seam welding is very satisfactory in joining pieces to be enameled.

These limitations do not mean that joined pieces of varying thickness cannot be coated. A conveyor screw varying in thickness from 2 in. on the shaft to ⅛ in. on the flights was successfully coated. Welds were smooth so the coating could be applied uniformly. In such a case, three or four preheatings may be necessary before final firing to equalize heat in all sections. Heat must thoroughly penetrate each section to insure adherence of the coating. Extreme variation in thickness should not be used because of this time-temperature factor.

Three categories of design may be formed on the basis of these requirements—the ideal, possible, and impossible. Ideal conditions include enameling iron or cast iron as the base metal, uniform gage, gas welds or spot-welded lugs or clips, a medium size part weighing from 5 to 20 lb and simple shapes without sharp edges or burrs.

In the possible category are complicated shapes of cold-rolled steel, arc welds, lighter and heavier sections joined together, and large pieces formed in several parts. Impossible conditions include zinc-coated sheets and nonferrous base metals, parts joined by brazing, silver soldering or soldering, and limitations imposed by the size of enameling furnaces.

Industrial uses of high-temperature porcelain enamels are many and varied. In one case, a combustion chamber in a crop drier was coated to increase efficiency, improve heat transfer and prevent corrosion due to weathering. The main part of the chamber has an 18-in. diam and is 60 in. long. A large number of protruding fins extend from the outer shell for additional efficiency. With a ceramic coating on the fins and chamber, the drier can be run for long periods at temperatures above 1000°F.

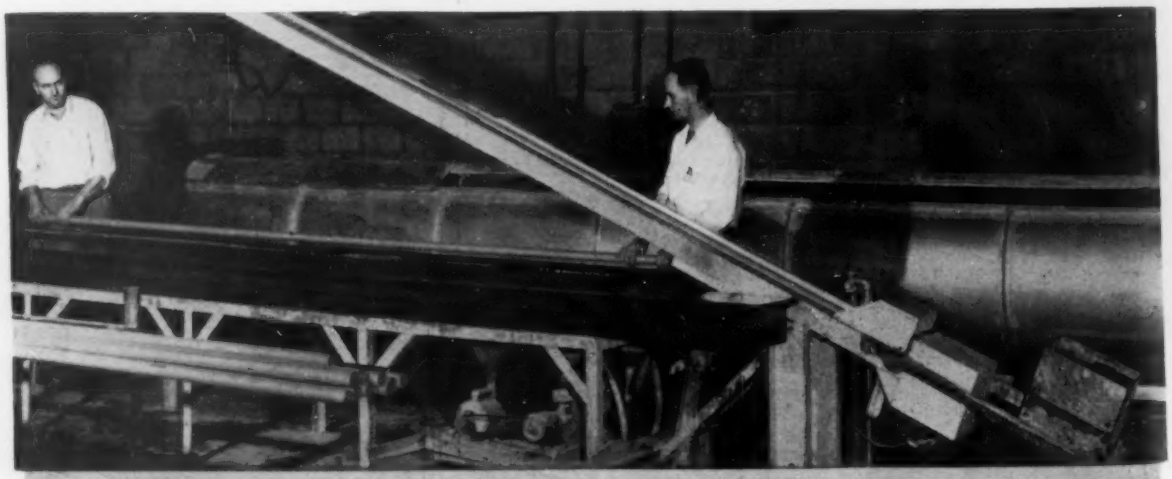
Mild steel, used as the base metal, replaces more expensive and scarce high-alloy stainless steels. The coating protects the base metal from scaling and physical breakdown which would cause the unit to fail. Numerous welds are also coated.

BASE METAL GUIDE

For High Temperatures

Base Metal	Maximum Temperature, °F
SAE 1010 steel	900
Cast iron	1400
NAX-series steels	1000
4340 steel	1000
430 chrome steel	1300
Timken steel (16-25-6 alloy)	1300 to 1400
347 stainless steel	1700
304 stainless steel	1700
309 stainless steel	2000
310 stainless steel	2000
314 stainless steel	2100
321 stainless steel	1700
446 stainless steel	2000
Inconel "C"	1800
Inconel "W" (heat treated)	1500

All metals are ceramic coated. Maximum temperatures are suggested to avoid intergranular corrosion and rupture or failure due to fatigue strains. No attempt is made to evaluate physical properties at high temperatures. Figures are based on tests running 150 to 200 hr.



NEW DIPPING UNIT applies liquid slip to tube evenly. The unit in the background is a drying unit which removes moisture from the surface before the porcelain enamel is applied.

Semiautomatic Tumbling Increases Output, Cuts Unit Cost

♦ LARGE-SCALE PRODUCTION and better finishes have been possible on many small and intricately-shaped parts in a large automobile plant using semiautomatic tumbling equipment.

The installation, built by Metals Finishing Corp., Hazel Park, Mich., was designed around four large tumbling barrels which process 13 different parts. Some parts must be held to close tolerances; sometimes to micro-inch finishes.

The barrels were installed in line and near floor level. The two banks of hoppers, one on each side parallel to the tumbling barrels, hold the parts and the tumbling media or abrasive. After parts and abrasive are released into the barrels in the correct proportions, water and cleaning compounds are added.

Cycling of the tumbling operation is automatic. Barrels rotate at the correct speed for a predetermined time, depending on the parts being processed. At the end of the cycle, the work load is discharged into large receptacles located below floor level. Perforated gates at the bottom of these receptacles allow most of the water to drain off, after which the hydraulically-operated gates dump the load onto a chain-driven belt conveyor.

Separation of the parts from the tumbling media is done by a magnetic separator. The separator then discharges the parts into a large washing unit where the parts are thoroughly cleaned and rinsed. The washer also treats the parts with a rust inhibitor preparatory for assembly.

Tumbling and cleaning operations are handled by one man. All parts are meeting rigid quality control inspection. Because of faster and better finishing, unit processing costs have been reduced considerably.

IN-LINE tumbling barrels receive small parts and abrasive from hoppers on either side. Cycling of the tumbling operation is automatic.

CONVEYOR lifts tumbled parts to hopper of a magnetic separator. After parts are separated from the tumbling media, they are washed, rinsed and are then treated with a rust inhibitor.

UNIVERSITY OF MICHIGAN LIBRARIES

Structural shapes—

Titanium Successfully

Hot Extruded

Part II

By: K. A. Wilhelm
Production Design Engineer
Lockeed Aircraft Corp.
Burbank, Calif.

G. A. Moudry
Chief Metallurgist
Harvey Machine Co., Inc.
Torrance, Calif.

◆ **Recent titanium hot extrusion studies by Lockheed Aircraft mark a major step forward in fabrication of titanium . . . Lower costs for aircraft structural parts are expected to result through application of the hot extrusion method.**

◆ **Titanium extrudes better than steel . . . Die filling is improved, surface finish is good and die wear is less . . . Dimensional tolerances for titanium extrusions will probably be comparable to present tolerances for hard aluminum alloy extrusions.**

◆ HOT EXTRUSION OF TITANIUM is practical and offers an ideal and economical method of producing aircraft structural shapes. These conclusions, presaging a major step forward in the fabrication of titanium, were reached by Lockheed Aircraft Corp., Burbank, Calif., and Harvey Machine Co., Inc., Torrance, Calif., after extensive studies of the extrudability of both titanium and alloy steels. Eighteen titanium shapes were extruded, in many cases with good surface and dimensional accuracy.

Big factor behind the extrusion studies, initiated by Lockheed and sponsored by the United States Air Force, is the high cost of making structural shapes from the titanium alloys. They are comparatively difficult and expensive to machine. The metal's relatively high cost makes it desirable to fabricate parts without reducing great amounts of metal to chips. This is particularly important in view of the fact that titanium scrap is difficult to reclaim. Cost of extruding structural titanium shapes has been estimated at one-fourth the cost of machining these same shapes from bar stock.

Part I—Alloy Steel, Titanium Can Be Successfully Hot Extruded, appeared in the April 29 issue of The Iron Age.

The titanium alloys were not difficult to extrude. These alloys, MST 3Al-5Cr, Ti 150A, and RC-130B, were found to fill extrusion dies well. Pressures required are reasonable though slightly higher than for steel. Extruding temperatures are lower than for steel. Extruded surfaces were excellent in some cases and, with improved lubricants, even better results can be expected.

Strengthwise, titanium extrusions compare favorably with forgings. Little difference was found between the extrusion characteristics of the alloys used.

The press used in steel extrusion studies, a 1650-ton horizontal hydraulic press, was also used for titanium. For metal economy a 5½-in. container diameter was used. Billets were heated in a barium chloride-sodium chloride salt mixture. The slight surface salt attack was mild enough to be negligible on extruded surfaces.

Finding a practical extrusion temperature was a first step toward successful hot extrusion of titanium. Titanium alloys have a melting point above 3000°F, but should be fabricated at relatively low temperatures to avoid pickup of undesirable elements. Forging data were analyzed to find a reasonable extrusion temperature test range. Recommended forging temperatures for the three alpha-beta alloys ranged from a high of 1900°F (starting) temperature

TITANIUM EXTRUSIONS included T and H sections such as these made from MST 3Al-5Cr.

for forgings to be heavily worked to a low of 1450°F for forgings to be worked less extensively.

Test temperatures of 1700°, 1800°, and 1875°F were chosen to evaluate effect of extrusion temperature upon extrudability and mechanical properties. The lower temperature, 1700°F, was found too cold for extrusion of some sections. All sections were extrudable at 1800°F and this temperature was used in later tests. The 3Al-5Cr was used in the temperature studies, with spot checks using Ti-150A.

Extrusion temperatures within the test range were not felt to have a significant effect on as-extruded static physical properties. No grain coarsening effect was noted because of the preheat temperatures, due probably to the large amount of metalworking during extrusion. At any given extrusion temperature the tensile strengths were somewhat proportional to the extrusion ratio.

Properties improved

Extrusion ratio was not expected to have great effect on the mechanical properties of titanium alloys since extrusion temperature is close to the transformation temperature. The allotropic transformation would erase mechanical strains resulting from the extrusion operation. Tests, however, showed definite increase in mechanical properties with higher extrusion ratios. Some part of this effect undoubtedly resulted from the extrusion operation. Quenching effects after extrusion have not been completely evaluated.

To study extrusion pressures, time, dimensions and surface condition, as-extruded physical properties, and properties after heat treatment, extruded rounds were obtained from 36 titanium-alloy billets. In general, titanium rounds require higher pressures for extruding than alloy steels. Die openings were selected to provide extrusion ratios of 10, 20, 50 and 100. Higher extrusion ratios were found to result in faster die wear. Extruding temperatures were held within the range of 1750° to 1800°F. Glass wool and moly-disulfide lubricants were used.

Both T and H sections were extruded in each alloy. The 18 extrusions ranged from 8 to 13 ft in length. No difference in extrusion characteristics was found in the three alloys. The H section, because of higher extrusion ratio, required higher pressures to extrude.

Shapes included a T with leg thicknesses of 0.215 and 0.315 in. respectively, and an H shape with 0.100-in. leg thickness. The T was extruded in 10-ft lengths and the H in 12-ft lengths. Extrusion temperature was 1800°F.

Dies for both rounds and shapes were flat faced, made from hot work steel and hardened to Rc 54. No hard facing was used. Much more work has to be done in establishing die design principles, tolerances, and optimum conditions for extruding a particular alloy in a given configuration.

To determine the effect of extrusion ratio on filling, pressure, and general extrudability three alloys, 3Al-5Cr, Ti-150A and RC-130B,

LOADING BILLET into container of extrusion press at plant of Harvey Machine Co., Inc.

UNIVERSITY OF MICHIGAN LIBRARIES

Tolerances for titanium extrusions will probably compare with hard aluminum alloy extrusions.

were extruded for each of the extrusion ratios: 10:1, 1.58 in. diam; 20:1, 1.13 in. diam; 50:1, 0.706 in. diam; 100:1, 0.500 in. diam.

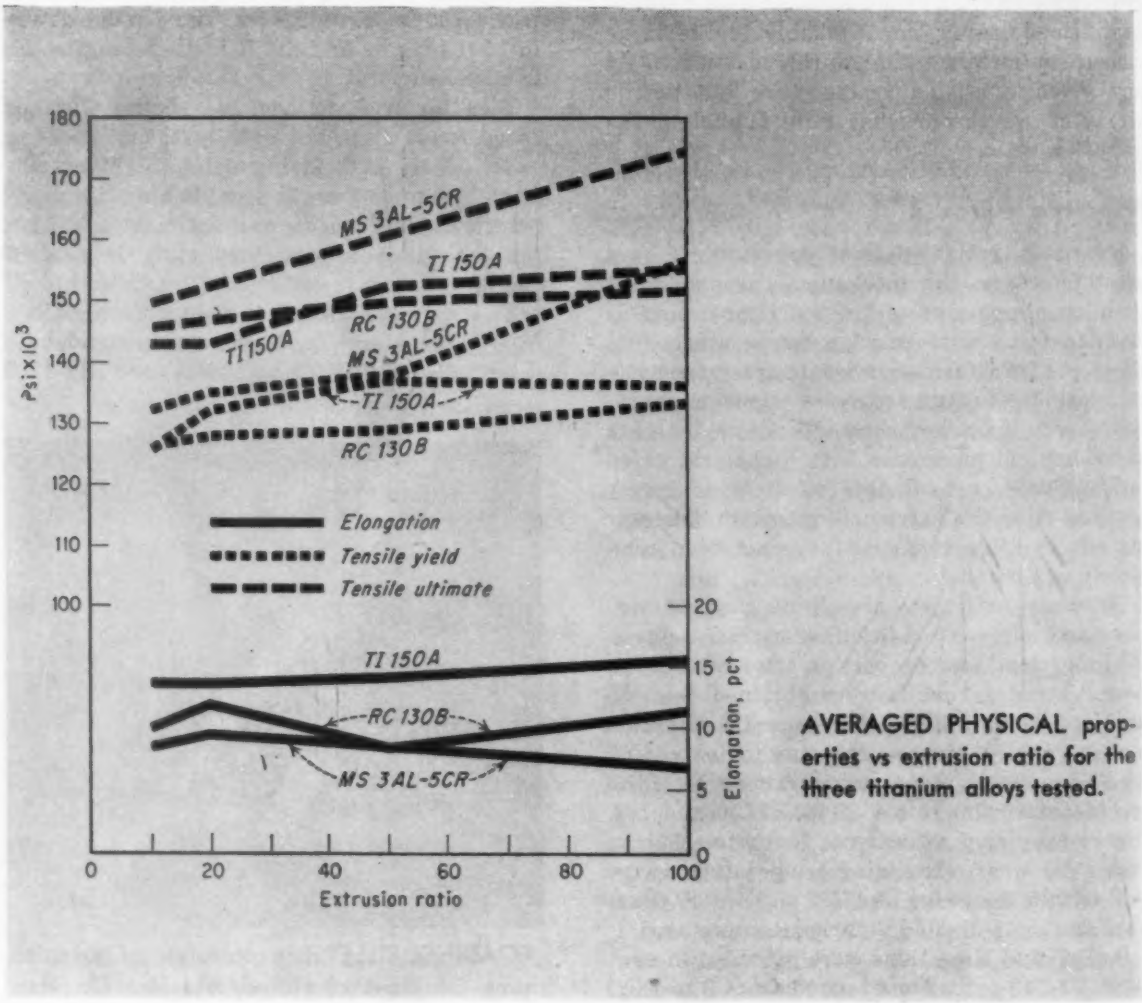
Titanium, so far as these shapes are concerned, extrudes better than steel. Die filling is improved, surface finish is good and die wear is less. Dimensional tolerances for titanium alloy extrusions probably will be comparable to the present tolerances for hard aluminum alloy extrusions. To obtain better die life additional development work will be required on die materials, die design and lubricants.

With titanium extrusions, as with steel, runout speeds are from 500 to 1500 fpm. At these speeds, mechanical guiding methods must be developed.

Titanium shapes presented some problems in straightening and heat treating. The heavier T section responded favorably to cold straightening. The thinner H section was difficult to cold straighten. Several broke during forming. One solution to the problem of straightening extruded titanium alloy shapes is to use stretch straightening equipment built in as part of the runout table so that forming can be accomplished before extrusions can cool below 800°F. An alternative solution is to construct auxiliary hot straightening equipment for the same purpose.

The three titanium alloys extruded were: (1) Titanium Metals Ti-150A, with a nominal 1.5 Fe-2.5 Cr. (2) Rem-Cru RC-130B, with a nominal 5.0 Al-5.0 Mn. (3) Mallory Sharon MST 3Al-5Cr. The upper critical for these alloys is approximately 1700° to 1800°F. Consequently, the hot work took place either very high in the alpha + beta field or completely within the beta field. Subsequent cooling resulted in nucleation and growth of the pro-eutectoid alpha.

As-extruded microstructures transverse to the direction of extrusion show that a fairly continuous network of alpha outlines the grains. Grains are equiaxed indicating transformation took place during the cooling cycle after extrusion. The carbides in the 3Al-5Cr alloy were not in solution at the billet preheat temperature. Consequently, they reveal the extrusion flow pattern. Extrusion temperature over the range studied, 1700° to 1875°F, had very little effect on the microstructures of these three alloys.

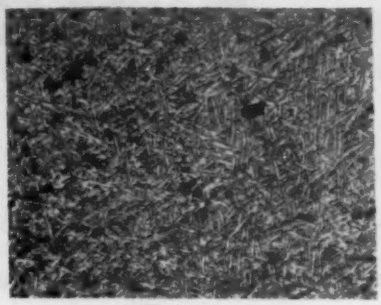


AVERAGED PHYSICAL properties vs extrusion ratio for the three titanium alloys tested.

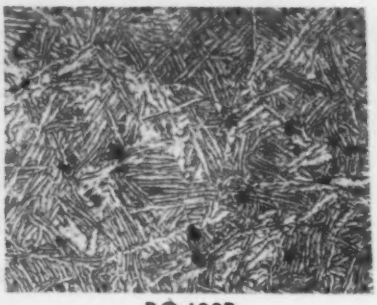
How Extrusion Affects Metal Structure

Titanium billet structure, as received 100X

MST 3A1-5Cr

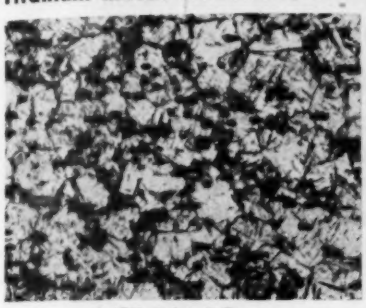


Ti-150A

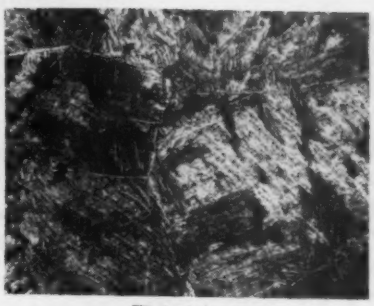


RC-130B

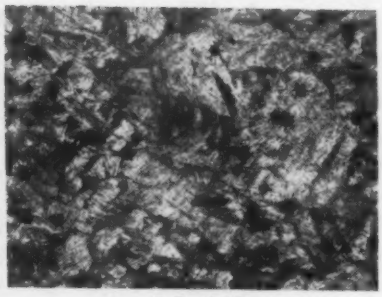
Titanium metal structure, as-extruded 100X



MST 3A1-5Cr



Ti-150A



RC-130B

The extrusion ratio had varying effects on the microstructures of the three alloys. The distribution and nature of the precipitated alpha depends essentially on the temperature at which the alpha was formed. The as-extruded structures were dependent on the cooling rate of the extrusion. Cooling rate of the extrusion was directly dependent on extrusion ratio and resulting section size.

Slow cooling rates occurring with low extrusion ratios resulted in relatively coarse alpha precipitation within the grain and as a grain boundary network. Faster cooling rates result in a less continuous and finer network of alpha at the grain boundaries and a much finer alpha within the grain.

In general, these metallurgical conclusions apply for titanium:

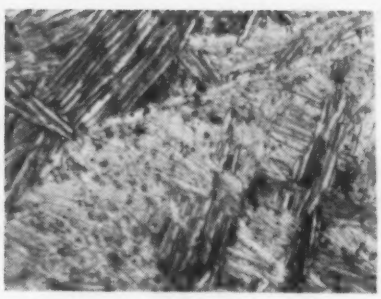
1. Extrusion temperatures from 1700° to 1875°F appear to have little effect on the resulting properties in these limited tests. However, additional work is necessary. Metallurgically, lower temperatures should increase the ductility.

2. As-extruded properties are generally similar to published typicals for hot-rolled bar and forgings.

3. Extruded sections show an unworked proeutectoid alpha outlining the grains.

4. The distribution of alpha depends on the cooling rate of the extrusion, and hence is dependent on section size.

The extrusion of titanium alloys is particularly attractive to the structural engineer in that the very nature of the extrusion process tends to give a uniform product through a blending working in the container of the extrusion press. Through this mixing operation, the problem of segregation that has given some trouble in rolled material is considerably minimized. The mechanical properties of extruded lengths have been very uniform from front to rear.



LONGITUDINAL section of Ti-150A, extruded at ratio 20, 1800°F, then heat treated, 500X.

ACKNOWLEDGMENTS

The authors wish to thank the following companies for their assistance: Allegheny Ludlum Steel Corp., Pittsburgh; Canton Drop Forge & Mfg. Co., Canton, Ohio; Tube Reducing Corp., Wallington, N. J.; Babcock and Wilcox, Beaver Falls, Pa.; Loewy Construction Co., New York; Moczyk Tool and Die Co., Detroit.

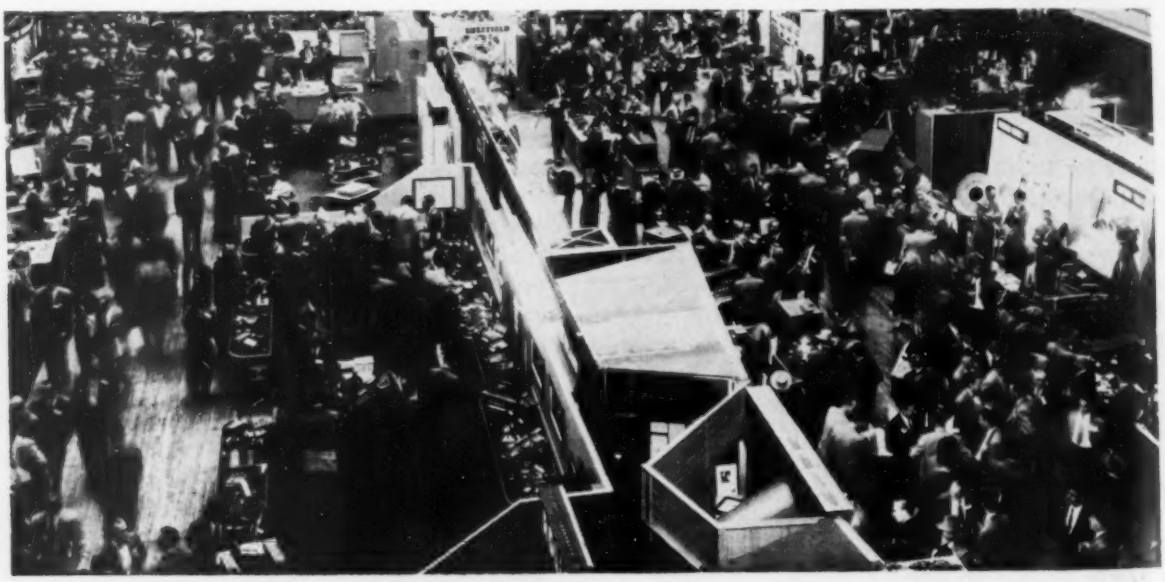
ASTE New Tooling Ideas . . .

- **Carbide seminar, production line popular feature**
- **Building blocks of automation widely shown**
- **Flexibility in machines, tooling stressed**
- **More automatic gaging cuts costs**
- **Ultrasonic cleaning, machining get wide attention**

◆ NEW METHODS OF CUTTING production costs in the more competitive atmosphere of today's business brought more than 20,000 tool engineers to Philadelphia, April 26-30, for one of the most successful shows ever run by the American Society of Tool Engineers. The Industrial Exposition filled the city's big Convention Center to overflowing as visitors from all parts of the nation crowded in to see the more than 475 exhibits. Top flight technical papers were presented by 35 leading authorities at daily forum sessions and panel discussions.

Three trends stood out at the show. More equipment is being designed for added flexibility and adaptability for short runs. Tremendous interest was shown in cutting tools and holders designed to reduce setup, down time and grinding time in the shop. The building blocks of automation were more in evidence than ever. Air and hydraulic cylinders and controls, limit switches, electronic units, gages, feeders, indexing devices which can be applied to specific shop tooling problems were widely shown.

A 5-day seminar on new carbide techniques, tooling and applications was featured for the first time this year. The sessions, sponsored by the ASTE, the University of Pennsylvania and cooperating carbide producers and machine tool builders. Popularity of the seminar suggests its possible inclusions in future Exposition programs. Backing up the seminar, was a full scale working demonstration at the Exposition in which regular production carbide tools were being made. Eighteen companies cooperated in the venture by supplying machinery, skilled help, and technical know-how. For new ASTE officers see news section.



SETTING THE TONE for greater precision in modern production requirements were the many new inspection devices shown in Precision Hall at the 1954 Industrial Exposition, Philadelphia.

Show Highlights . . .

Flexibility and Costs . . .

Look for greater flexibility in tools and machine tool accessories to give you more for your tooling dollar. Improved cutting tools, turrets, live screw machine chucks, new press feeding devices are increasing production rates on all machinery.

New Carbide Cutting Grade . . .

A new steel cutting cemented carbide is said to be 30 pct more effective than present types for light roughing and general finishing. It combines toughness and wear resistance; holds an edge to 1800°F.

Indicator Maintenance Less . . .

Excessive maintenance in dial indicators has been largely eliminated with a new indicator design which uses a cam and helix mechanism Error due to friction and wear has been reduced and backlash has been minimized.

Toolholders Lower Setup Time...

More quick-clamping carbide toolholders are being used to cut both setup and down time. Some have built-in chipholders, convert from negative to neutral rake. Others use throwaway carbide inserts.

Speed Up Testing . . .

Automatic feeding devices long standard on production tools are showing up on more and more inspection tools. Automated hardness testing, size gaging and surface inspection catch rejects at early stages to cut later costs.

Rotary Type Air Compressor...

Constant high pressure air is delivered cool, clean, and moisture free by a new type air compressor. Eccentric action of a slotted rotor with free moving vanes compresses air quitely, efficiently.

Saves Drafting Time . . .

Engineers and designers stood three deep to see a new circular drawing machine demonstrated. This universal compass is easily set up and used, draws ellipses, spirals, helixes and arcs with two simple instrument settings.

Cuts Costs On Lathe Jobs . . .

A combination tool holder and lathe "chuck" replaces the usual cross slide, grips work and indexes eight tool bits for bar stock cutting. Work support shifts with tool movement, minimizes chatter and prolongs tool life.

Ultrasonic Cleaning Grows . . .

Workpieces up to 150 lb are now being cleaned effectively and economically with ultrasonic cleaning equipment. A barium titanate transducer immersed in a chlorinated solvent removes difficult soils.

Building Blocks for Automation . .

Compressed air, hydraulic and electronic components, the building blocks of automation, were widely demonstrated. Special control, indexing, work handling devices of increasingly wide variety underscore the trend toward low cost automation for the jobbing machine shop.

Both Ends In One Cyle . . .

Marked interest was shown in a new automatic single spindle screw machine which machines both front and back ends of work pieces in a single cycle. It saves labor, power and floor space.

Ultrasonic Machining Handles Difficult Materials

J. P. Aloisio

An ultrasonic machine tool can machine many brittle and hard materials difficult or impossible to machine by other means. It converts electrical energy to mechanical motion. This motion, which is transmitted to the tool tip, varies from 0 to 0.002-in. at the rate of 27,000 times per second. An abrasive, suspended in a vehicle like water, is made to flow between the tool tip and the workpiece. Rate of material removal depends on amplitude, grit and mixture ore, the abrasive, pressure applied, tool tip material and composition of the workpiece. Glass, quartz, Stellite, tungsten carbide, sapphire, hardened steel and many other materials can be machined by this method.

J. P. Aloisio
Applications Engineer
and
N. Clark, Jr.
Research Div.
Raytheon Mfg. Co.,
Waltham, Mass.

Tool Requirements for Powder Metal Parts

Good die construction and a high degree of accuracy and finish are musts for producing quality powder metal parts without breakage or jamming. Very accurate parts require die-to-punch clearances of 0.0002 or 0.0003 in. For less accurate parts, clearances range from 0.0005 to 0.001 in. Close clearances are also necessary to prevent seizing due to entrapment of fine particles. Cavity surfaces must be lapped and polished to a very high finish, preferably under 10 micro-inches. Final lapping should be in the direction of pressing. Die construction is either of hardened steel or carbide. Wear-resistant steel dies show little distortion on hardening. Most popular is high-carbon, high-chrome steel hardened to about 65 Rc. Even greater wear resistance is obtained when 4 pct vanadium is added. Tough steels, such as tungsten alloy chisel steels, hardened to about 58 Rc are used for punches. Demand for high-density iron parts, which rapidly wear steel dies, is creating greater usage for carbide-lined dies. Recently, hot-pressed one-piece carbide cavities have been developed which are close to finished size and require minimum diamond lapping.

J. F. Kuzmick,
President,
Welded Carbide Tool Co.
Clifton, N. J.

Electric Eye Speeds Flame Cutting of Metals

Electric-eye scanning, used in conjunction with low-cost templates, provides a fast, economical method of flame cutting. The electric eye accurately follows a line of demarcation between a dark template board and a light plastic tape which is layed out to the desired cutting pattern. A light spot reflected by the tape and picked up by photo tubes controls the steering mechanism. Either a single torch or multiple torches mounted on the cutting machine follow the exact pattern traced by the scanning device. Templates are easily prepared and design changes can be made quickly. A number of parts for a large weldment can be layed out on a composite template, eliminating the need for many small templates. Also, parts can be "chained" together so that all parts are cut in one continuous traverse. Using this technique, savings are considerable.

R. F. Helmkamp,
Machine Cutting Specialist,
Air Reduction Sales Co.,
New York

New Gaging Ideas Pace Production

Pacing industrial progress has been the ability to divide the inch smaller and smaller —first into thousandths, then ten thousandths, and now in many cases into millionths. Broad developments in both methods and equipment for measuring have led to better gaging and inspection. In the field of air gaging alone, many new tools reduce costs, give greater accuracy and enable faster checking for quality control. By integrating such tools into the machining operation, inspection, classification, and segregation of parts by size can be made completely automatic. It is this trend which keeps work quality and production rates at a high level and at lower unit cost. Gaging elements applied to machine tools make it more difficult to produce scrap than to produce acceptable parts.

W. I. Wilt,
Asst. Mgr., Gage Div.
and
H. Kiefaber,
Gage Application Engineer,
Sheffield Corp.,
Dayton, Ohio

Gear Hobbing Costs Cut On Low Carbon Steel

Accurate gear hobbing on low-carbon steels under 225 Bhn can be done at speeds of 275 to 300 sfpm without extra equipment, manpower, tool cost or maintenance. Feeds of 0.090 to 0.100 ipr give excellent tool life and work quality. By delivering the coolant at pressures of 100 to 225 psi, tool life is greatly improved. Gears are also kept cooler, giving closer control over size. With light feeds, it appears that hook angles of 27 to 30° are best for speeds up to 350 sfpm. Small changes in speed, particularly above 300 sfpm, can affect hob life greatly. The limiting factor in hobbing heavier pitch gears is not in tool wear, but in the limits of the hobbing machines themselves.

J. W. Rapp
Supt. of Gear Manufacturing,
Ohio Axle and Gear Div.,
Rockwell Spring & Axle Co.
Newark, Ohio

Shear-Fracture Method Improves Billet Cutting

Workable pieces for cold extrusions or hot forgings can be cut quickly, accurately and without waste from billets, bars, plates and sheets by the shear-fracture method. By this method, a rapidly mounting pressure is exerted along the full width of the moving shear knife the moment it contacts the workpiece. An equal opposing pressure builds up simultaneously on the lower blade. Partial deformation occurs, and when the opposing forces exceed the yield strength of the material, complete fracture takes place. Level support for the blank as well as for the bar or billet assures square surfaces on both ends of a shear-fractured blank. Shear knives average 9000 cuts per grind on 4-in. round-cornered squares of 8620 steel. Production rates range from 500 pieces per hour on large billets to 1500 pieces per hour on smaller sizes.

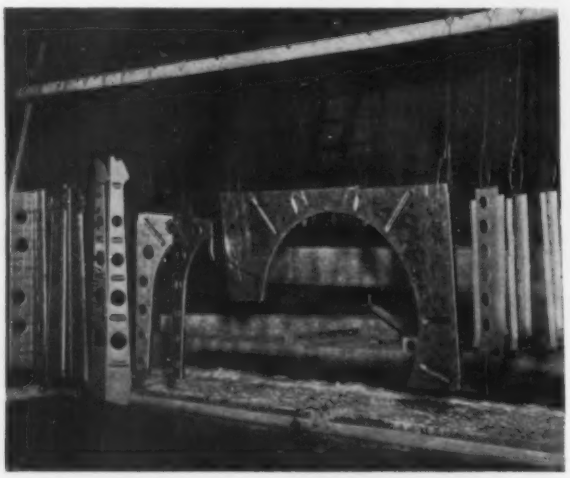
W. C. Tucker,
Chief Engineer,
Buffalo Forge Co.,
Buffalo

UNIVERSITY OF MICHIGAN LIBRARIES

On aluminum parts—

Free Fall Quench Cuts Solution Heat Treat Costs

◆ FREE FALL QUENCH handling of aluminum parts in salt bath furnace solution heat treatment has cut time required for this operation by upwards of 40 pct at The Glenn L. Martin Co., Baltimore, Md.



PARTS ARE SHOWN suspended, with stainless wires, from rotable tube prior to free fall quench.

This method of handling aluminum aircraft parts helps overcome some disadvantages arising from conventional handling. Customarily, aluminum parts are placed in a basket, immersed in molten salt, then lowered into running cold water.

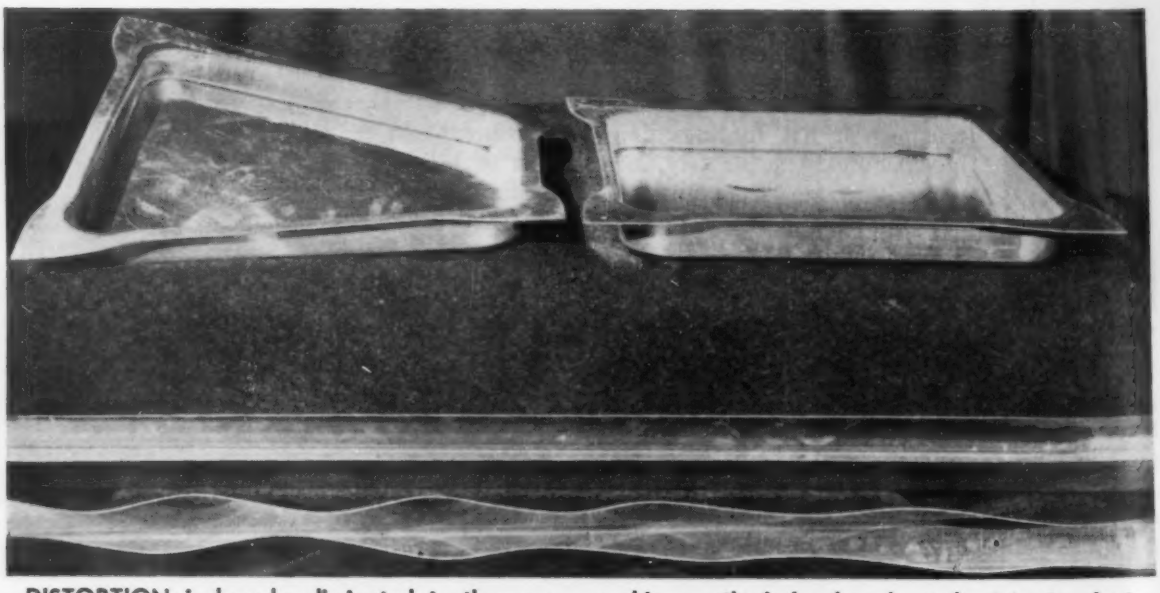
The basket absorbs much of the heat of the salt bath, requiring longer immersion of the parts. Considerable nitrate salt is lost by carry-out. Although it takes but a few seconds for the parts to enter the water, they are exposed for a sufficient time to a splash atmosphere to cause, in many cases, severe distortion. This distortion is later removed by hand work.

In the free fall quench process, parts are suspended from a long pipe over the tanks by stainless steel wires. This pipe can be moved from tank to tank. A counter-balance causes the pipes to rotate when a trigger is released and parts suspended on the pipe drop into the bath.

Means multiple savings

After a predetermined period, the pipe and parts are lifted from the bath. When tripped by the operator, the pipe revolves, dropping the parts into the cold water. The speed and angle at which parts enter the water creates a minimum amount of splash. After quenching, a basket previously placed in a cold water tank, is lifted and the parts removed.

Cost savings are made in several ways. Less nitrate salt addition is required. The time cycle is shortened because heat is absorbed only by parts requiring treatment. Because of the reduction of splash, part distortion is reduced by as much as 90 pct, it is claimed. This eliminates a major part of hand bench work previously required. Both large and small aluminum parts can be more efficiently handled by this process and at a considerable savings in time and money.



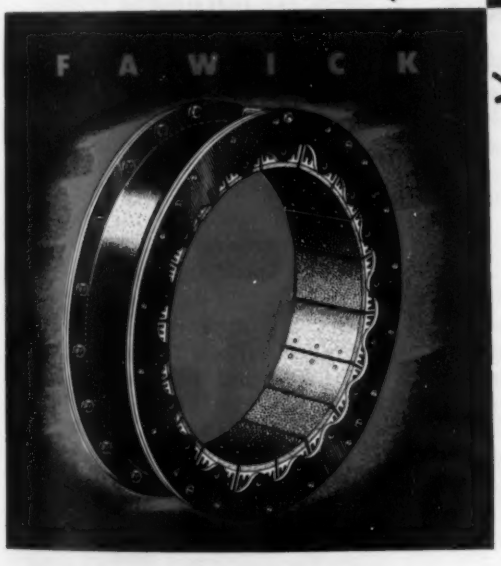
DISTORTION is largely eliminated in the new quenching method developed at the Martin plant.

THREE QUICK NOTES FOR BUSY EXECUTIVES

1 2 3

Kropp Forge #409 Rockford Press equipped with a FAWICK Package Conversion Unit consisting of a FAWICK Ventilated 37VC650 Air-Ring Clutch and a FAWICK 28VC650 Air-Ring Brake.

Photo courtesy of Kropp Forge Co.



The famous FAWICK completely ventilated Type VC Air-Ring Clutch which features (1) cooler operation inherent in drum clutch design, (2) isolation of the operating tube from the heat-generating friction surface, (3) riveted, replaceable friction lining, and (4) loose, expanding operating tube which can be replaced without removing the clutch from the shaft.

1 FAWICK Advanced-Engineering *pays off* for industry . . . pays off by increasing machine productivity and by improving machine performance . . . pays off with increased safety to both machines and men.

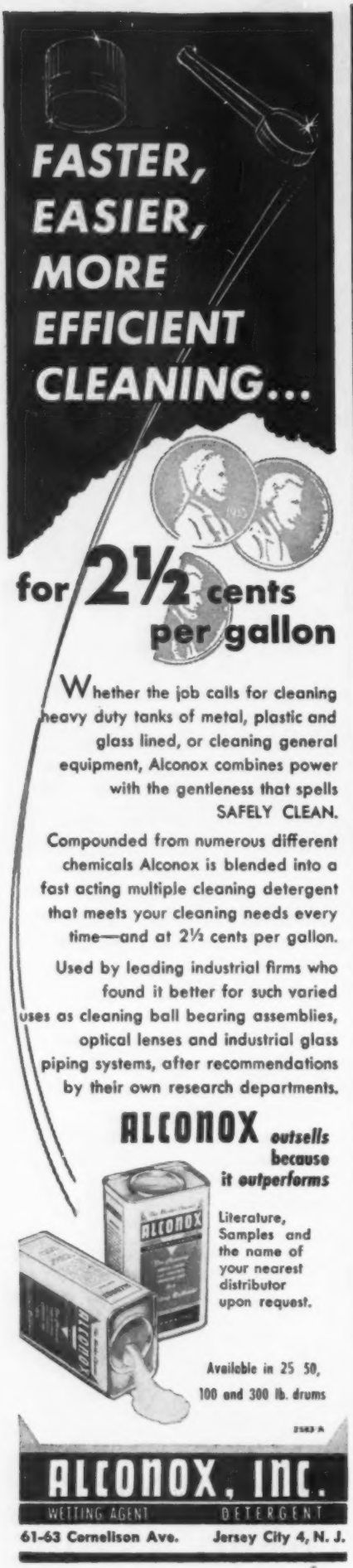
2 FAWICK Airflex Clutches and Brakes have proved *by performance* that they provide more operating advantages because of their exclusive design.

3 The complete facilities of the FAWICK Engineering Service are available to show the practical advantages of FAWICK Airflex Clutches and Brakes as applied to specific power transmission problems.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For full information on these and other FAWICK units, write for Bulletins 400-A and ML-102.

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES


FASTER, EASIER, MORE EFFICIENT CLEANING...
for 2½ cents per gallon
Whether the job calls for cleaning heavy duty tanks of metal, plastic and glass lined, or cleaning general equipment, Alconox combines power with the gentleness that spells SAFELY CLEAN.
Compounded from numerous different chemicals Alconox is blended into a fast acting multiple cleaning detergent that meets your cleaning needs every time—and at 2½ cents per gallon.
Used by leading industrial firms who found it better for such varied uses as cleaning ball bearing assemblies, optical lenses and industrial glass piping systems, after recommendations by their own research departments.
ALCONOX outsells because it outperforms
Literature, Samples and the name of your nearest distributor upon request.
Available in 25 50, 100 and 300 lb. drums
ALCONOX, INC.
WETTING AGENT DETERGENT
61-63 Cornelison Ave. Jersey City 4, N. J.

FREE

Technical Literature

Kaiser History

Henry J. Kaiser Co. observed its 40th year in business in a colorful anniversary report combining the production and financial activities of all Kaiser-managed industries. The report sums up the following: Approximately 68,000 employees; annual payroll of $271 million; expenditures of $90 million for expansion during 1953; 116 plants and facilities in 15 states and territories and 13 foreign countries. *Henry J. Kaiser Co.*

For free copy circle No. 1 on postcard, p. 141.

Conductors

Major milestones in the development of aluminum electrical conductors by Aluminum Co. of America are described in *Alcoa Research and Progress in Electrical Conductors.* Text traces history of Alcoa conductor research, covering both its pioneering development work and present projects. *Aluminum Co. of America.*

For free copy circle No. 2 on postcard, p. 141.

Riveters

New bulletin on Keller compression riveters has been released by company. Outstanding performance features listed are variable power, automatic cycling, adjustable backstroke, operates on low air pressure, easy to set up, simple to operate and adaptable to automatic set-up. *Keller Tool Co.*

For free copy circle No. 3 on postcard, p. 141.

Piping

Brochure describes modern industrial pipe manufactured by Michigan Pipe Co. Types included are wood-lined steel pipe, saran rubber-lined steel pipe, light gage piping fabrication carbon steel, stainless steel and Monel metal, wood stave pipe and fabricated fittings for all Michigan pipe. *Michigan Pipe Co.*

For free copy circle No. 4 on postcard, p. 141.

Rubber products

New 12-p brochure on O-rings, giving detailed information on compounds, groove dimensions and sizes, has just been published. Booklet contains diagrams of typical applications and is intended to be helpful to designers and to users of O-ring seals. *Goshen Rubber Co., Inc.*

For free copy circle No. 5 on postcard, p. 141.

More Literature Available

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Taps

Jarvis Tap Manual and Catalog has been designed to do a threefold job. First, it completely describes Jarvis facilities. Secondly, it gives modern and complete references on the uses, types and performances of industrial taps. And lastly, the illustrated catalog lists the entire range of Jarvis taps. *Charles L. Jarvis Co.*

For free copy circle No. 6 on postcard, p. 141.

Equipment

Bulletin shows the complete line of Continental Electrical Distribution and Control Equipment, covering every link between utility power source and industrial or institutional application. *Continental Electric Equipment Co.*

For free copy circle No. 7 on postcard, p. 141.

Comparator

S22 Microfinish comparator provides industry with established flat-surface roughness specimens for visual and tactual comparison. Comparator is used in specifying and controlling surface roughness when a product having the appearance of typically machined surface is required. Brochure describes facts and features. *Baptist Machine Co.*

For free copy circle No. 8 on postcard, p. 141.

Space saving

If you are crowded for space, want to improve the efficiency of any job, or are planning a new product, department or factory, *More Dollars from Less Space* will help your thinking and will start you on the way to automation in a practical way. Booklet tells how one manufacturer used Alden Work Centers and associated equipment to produce a 40 pct saving in space and how another created a continuous flow layout of a new product. *Alden Systems Co.*

For free copy circle No. 9 on postcard, p. 141.

Cylinders

Specifications and engineering data regarding air and both high and low pressure hydraulic cylinders are included in catalog released by Petch Mfg. Co. The air and low pressure hydraulic cylinders range in size from 1½ to 10 in. bore and the high pressure hydraulic from 1½ to 6 in. *Petch Mfg. Co.*

For free copy circle No. 10 on postcard, p. 141.

Tandem mill

Ten-stand tandem mill is the principal unit in a line of equipment designed by Farrel-Birmingham for the continuous production of ⅜-in. aluminum rod from molten metal. Illustrations and technical data are given in brochure. Also included are illustrations and data on breakdown and edging mills for nonferrous bars. *Farrel-Birmingham Co., Inc.*

For free copy circle No. 11 on postcard, p. 141.

Bolts

High-strength High-tensile Steel Bolts have been used for many years in a wide variety of engineered applications. In the last few years, however, great impetus has been given to the use of these bolts in the structural field. Principles of high-strength bolting, mechanical requirements and specifications are given in 8-p. booklet. *U. S. Steel Supply Div., United States Steel Corp.*

For free copy circle No. 12 on postcard, p. 141.

Bench press

Model 500 precision press is a sturdy, compact bench mounted press which is self-contained and uses shop air line power. It is easily moved about to point needed at any time and requires no wiring. Ram closing power is a fraction of final power, thereby preventing damage to dies if parts are incorrectly placed. Full details and diagrams are given in brochure. *Alliance Mfg. Co.*

For free copy circle No. 13 on postcard, p. 141.

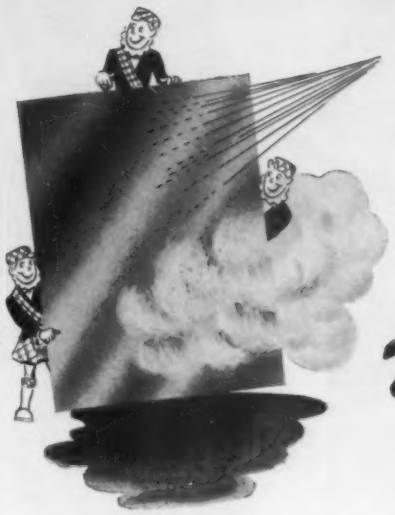
Cranes

Recent catalog on electric overhead traveling cranes is now available from Victor R. Browning & Co., Inc. Company has two distinctive overhead crane lines. One is the mill crane and the other is the industrial crane. Many illustrations are included in this 30-p. release in addition to detailed information on various crane parts. *Victor R. Browning & Co., Inc.*

For free copy circle No. 14 on postcard, p. 141.

Turn Page

Extra corrosion resistance—



Type 316 stainless is now available in MicroRold®!

Cut your job costs by ordering *Washington Steel MicroRold* Type 316 stainless steel. Remember, job costs are figured on a square foot basis—while material is bought by weight. Why pay a premium for stainless surface area by receiving material on the heavy side of the gauge you order? Special equipment at Washington Steel assures accurate "thinness control" on MicroRold . . . and you can specify that your MicroRold Type 316 be rolled to the light side of the gauge range. You'll save money!

MicroRold Type 316 Stainless is available as follows:

SHEETS

Max. 36" wide	No. 4 and No. 7 Finish	.012 to .109
Max. 36" wide	2B and 2D Finish	.005 to .078
Max. 36" wide	Physicals—(average)	

Condition	Annealed
Ultimate Tensile Strength P.S.I.	85,000
Yield Strength (.2% set) P.S.I.	40,000
Elongation in 2 inches, %	55
Rockwell Hardness	B 75-80
Scaling Temperature, °F	1700
Grain Structure	Austenitic-Nonmagnetic

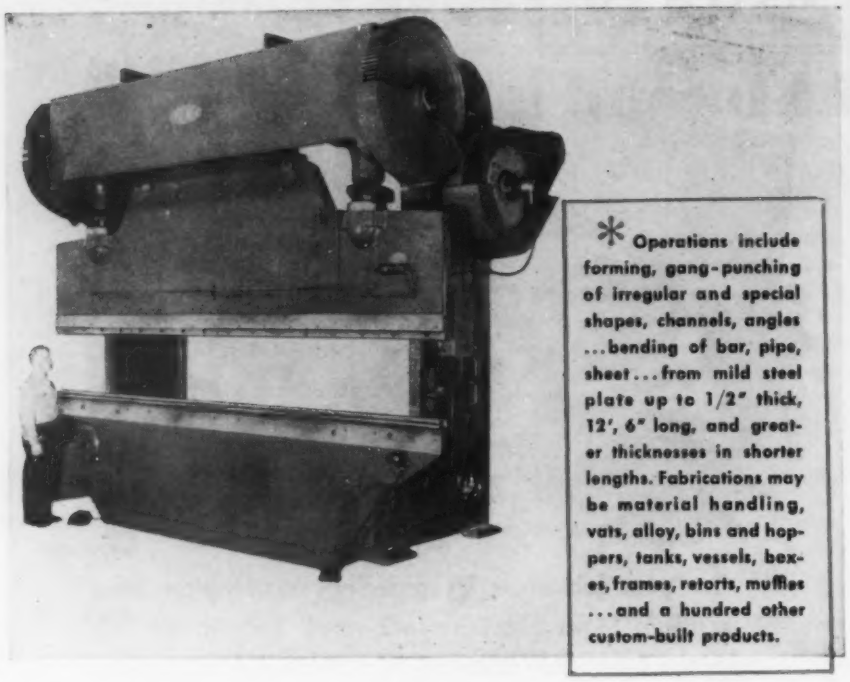
STRIP

.005 to .078, in No. 1 and No. 2 Finish
.0015 to .009 (Veri-Thin), up to 23 15/16" wide, Bright Annealed

Ask your steel warehouse distributor about MicroRold Type 316 Stainless—widely used throughout the chemical industry and wherever applications must resist salt spray, damaging industrial fumes, acid salts and reducing acids. It will pay you to get full details now!

Washington Steel Corporation
WASHINGTON, PENNSYLVANIA

UNIVERSITY OF MICHIGAN LIBRARIES



* Operations include forming, gang-punching of irregular and special shapes, channels, angles ...bending of bar, pipe, sheet... from mild steel plate up to 1/2" thick, 12', 6" long, and greater thicknesses in shorter lengths. Fabrications may be material handling, vats, alloy, bins and hoppers, tanks, vessels, boxes, frames, retorts, muffles ...and a hundred other custom-built products.

I AM A NEW MACHINE
ALL SET TO PRODUCE FOR YOU

The name, gentlemen, is Chicago Press Brake, and I have just been installed in the plant of Rolock Incorporated, Fairfield, Connecticut. They have asked me to speak for myself.

First of all, you can see that I'm a husky specimen . . . 17 ft. in height, 80,000 lbs. in weight . . . with a tremendous capacity for producing heavy work. I have joined the Rolock machinery group partly to lower costs and speed production of our fabricated heat and corrosion resistant alloys . . . and also to handle larger and stronger components for the chemical and food processing fields.

I shall be working with highly experienced engineers, fabricators and welders, who have made Rolock a top name for supplying engineered-to-the-job Heat Treating equipment for the country's leading metal working plants.

So, as the most versatile tool in any fabricating plant, Rolock is offering my products for the solution of your problems concerned with fabrications* you may require. Mr. Roger P. Welles, President of Rolock Incorporated, has suggested that you write to him, personally, for discussion of your needs . . . and, if desired, our engineering recommendations.

SRL54B

ROLOCK INCORPORATED
1362 KINGS HIGHWAY, FAIRFIELD, CONNECTICUT

Free Technical Literature

Continued

Parts rebuilt

Complete information as to type of alloy to use, preparation, welding and finishing procedures for hard-surfacing equipment parts is shown in 126 separate illustrations and text of new Victor hard-surfacing manual. Sections cover equipment commonly used in the following industries: brick and clay, cement, coal mining, dredging, earth moving, metal mining, rock products. *Alloy Rod & Metal Div., Victor Equipment Co.*

For free copy circle No. 15 on postcard, p. 141.

Water hose

To help you select the best water hose for your specific need, Quaker Rubber Corp. has just released a new full color bulletin describing the many types of Quaker water hose now available. This booklet contains photographs and cutaway sections of the various hoses as well as tables of sizes, working pressures and weights. Hose construction, lengths, couplings and recommended applications are also included. *Quaker Rubber Corp.*

For free copy circle No. 16 on postcard, p. 141.

Plastics

Recent bulletin describes in text and picture Devcon, the plastic metal for making durable and permanent drill fixtures and jigs, forming and drawing dies, holding devices, models and many other types of industrial equipment. Devcon can be formed in practically every shape and contour for holding a piece to be drilled, milled, planed, ground or broached. *Chemical Development Corp.*

For free copy circle No. 17 on postcard, p. 141.

Materials handling

The Benchevator, a new materials handling device that speeds work on anything handled in stacks or sheets, is described in new bulletin. It consists of a motor-driven, self-locking, screw-actuated column with a table top. This top can be made any desired size to handle various kinds of work such as paper, paperboard and sheet metals with a capacity up to 5000 lb. Raising or lowering of the table top is controlled by a push button which can be located anywhere within easy reach of the operator's foot or hand. *Rodney Hunt Machine Co.*

For free copy circle No. 18 on postcard, p. 141.

Turn to Page 141

DURCOPUMPS resist corrosion in electrolytic tinplate production at . . .

There are thirty-six Durcopumps on this Number 4 line at Weirton. Durcopumps are available in twelve standard alloys to supply heads to 240 feet and capacities to 2000 G.P.M.

WEIRTON STEEL COMPANY

Weirton Steel Company

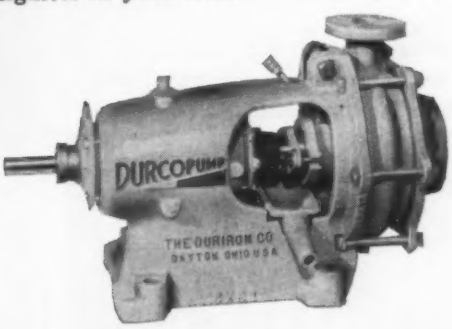
Weirton, West Virginia

Division of National Steel Corporation

Durcopumps handle the severely corrosive tin plating solutions at Weirton. These DuPont halogen solutions with low pH and containing fluorides are continuously circulated from collecting tanks to plating trays by Durimet 20 Durcopumps, which are completely insulated from stray currents. Weirton also uses Durco transfer pumps, filter pumps and sludge pumps.

Weirton Steel Company, division of National Steel Corporation, operates the world's largest single tin mill. The strip on the lines moves as fast as 2000 feet per minute. An example of Weirton thoroughness is the ability to plate a different thickness on each side of the strip to best meet customer requirements.

Durco products have been the answer to thousands of tough chemical service problems. Maybe we can solve yours. Write for Catalog 54 or call the Durco engineer in your area.



DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, INC., DAYTON, OHIO

Branch offices in principal cities

UNIVERSITY OF MICHIGAN LIBRARIES

NOW!
SEE THE DIFFERENCE

in HORTON CHUCKS

New plastic demonstrators show the advantages of Horton's Famous Five Extras.

1. Exclusive pilot hole construction
2. Chrome nickel steel scroll heat-treated to 40-45 Rockwell C
3. Exclusive replaceable pinion bushings
4. Self-contained operating screws
5. One-piece body construction

Now you can SEE these built-in extras in actual operation. Ask your Horton Distributor NOW!

HORTON CHUCK
Windsor Locks, Conn.

Materials Handling:

Drop-bottom boxes, special trays, offer savings.

Large volumes of scrap frequently pose problems in handling and proper segregation. Inefficient handling and sorting methods can take big bites out of potential revenue from this source.

One new system of scrap handling is being used by a number of plants to cut costs and improve efficiency. The system features tierable, drop-bottom boxes and trays made by The Union Metal Mfg. Co., Canton, Ohio.

The Chicago plant of The Lamson and Sessions Co. saved 93.4 per cent of their scrap loading costs by using Work-O-Matic drop-bottom boxes. By tiering boxes five high in the scrap yard, the firm completely eliminated its scrap pile.

No Hand Shoveling

Previously, scrap was carried in 800 pound bin loads from production areas to the scrap yard, where the bins were emptied with a yard crane. The scrap was then hand-shoveled into gondola cars.

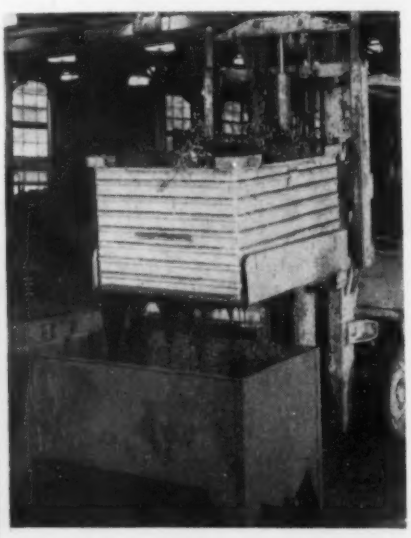
Now the company uses one fork-lift truck to dump loaded boxes of scrap into cars. An analysis of the old method showed scrap loading costs per 50-ton carload were $134.80. Today, use of the fork truck and drop-bottom boxes has reduced this cost to only $8.85.

Sides of the square Work-O-Matic box are of 12 gage corrugated steel. The hinged box bottom, turned up at the sides to form a chute, is a one-piece quarter-inch steel plate. A structural "I" beam across the front end of the box bottom prevents it from slipping back along the truck forks, and insures that material is dumped beyond the fork ends.

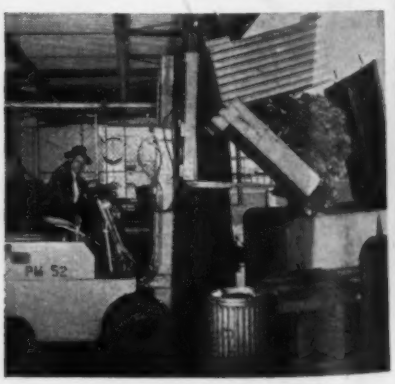
Boxes "Throw" Loads

Because the box front is held firmly by the fork ends, the hinge-end moves forward and away from the lifting mast during dumping. This thrust action permits the truck operator to "throw" the load.

Another user of Work-O-Matic boxes is General Electric's Aircraft Gas Turbine Division engine plant near Cincinnati, Ohio. With increased production during the Korean war, generation of metal



Cutting oil drained . . .



Turnings easily dumped . . .

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 141. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

scrap and other by-products increased ten-fold.

The many expensive alloys used made new scrap handling and segregation methods imperative.

Previously, scrap was collected at each machine in various containers, hauled to loading docks and piled, unsegregated, into dealers' trucks. Six men worked six hours to load one truck.

Cuts Loading Time

Now all scrap is segregated into drop-bottom boxes at the point of origin. These are fork-lifted to the loading docks and dumped into larger containers which are hauled to a central area in the plant yard. When a truck load of one scrap classification has been collected, a dealer is notified. His truck is loaded by two men in less than an hour, compared with 36 manhours previously required.

The sloped bottom of the drop-type box has been especially important to a large appliance manufacturer. Boxes handle oily turnings, dumping them into a gondola car inside the plant.

Stops Oil Waste

To conserve oil, a special receiving tub is spotted near the gondola car. During the fork truck trip to the dumping area, oil from the turnings flows down the

Simplifies loading . . .

Turn Page

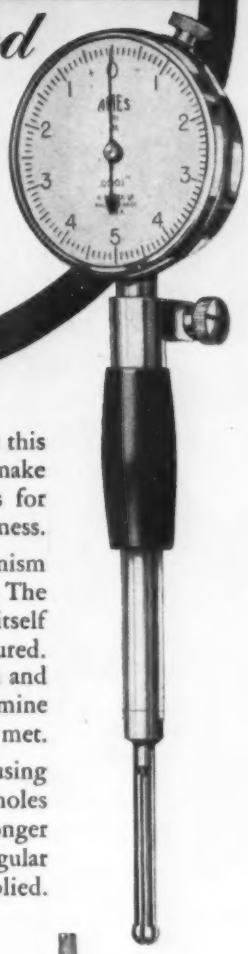
AMES

. . . *the Preferred*

FOR FAST, ACCURATE INSPECTIONS

Small Hole Gauge

No. 36



Skilled and unskilled employees can use this superbly designed two-point contact gauge to make quick, accurate, *impersonal* inspections of small holes for size, taper and roundness.

The Ames No. 36 has extremely sensitive mechanism especially designed to eliminate "feel" in measuring. The spherical contact point automatically centers itself and indicates the true diameter at the point measured. The operator has only to slide the contact in and around the hole and note the readings to determine if tolerances are being met.

The Ames Small Hole Gauge No. 36, using contacts in increments of 1/32", can check holes of 3/16" to 1" diameter, up to 2" depth. Longer lengths and special contacts to check irregular recesses, splines, etc., can be supplied.

Ames No. 15 Jaw Gauge

Ames No. 13 Dial Comparator

Ames No. 516 Dial Micrometer

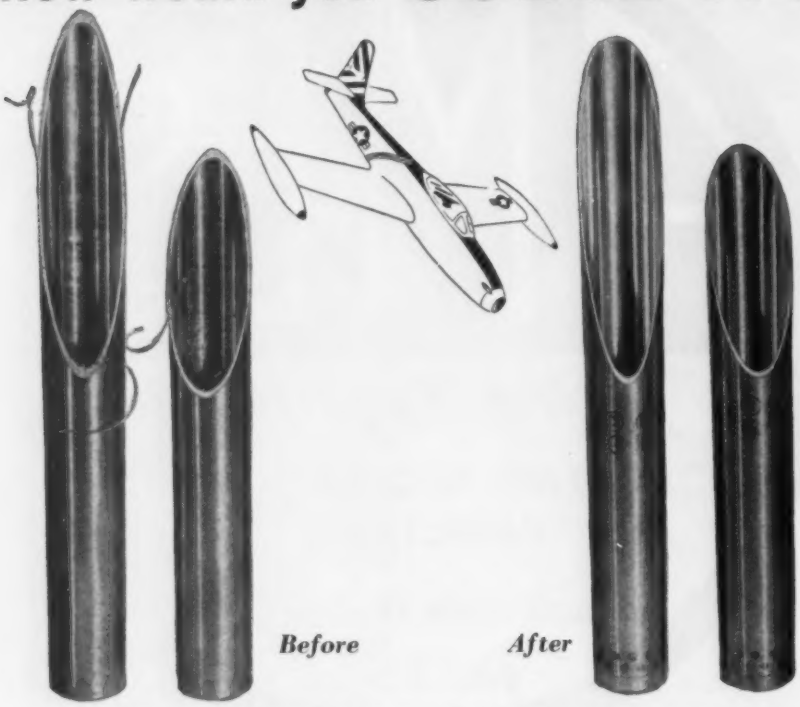
Ames No. 25 Pocket Thickness Measure

If you would like to have our recommendations on your measurement problem, send blueprints and specifications. Write for your free copy of catalog on Ames precision measuring instruments.

Representatives in principal cities. B. C. AMES CO. *25 Ames Street Waltham 54, Mass.*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

How would you SOLVE IT?

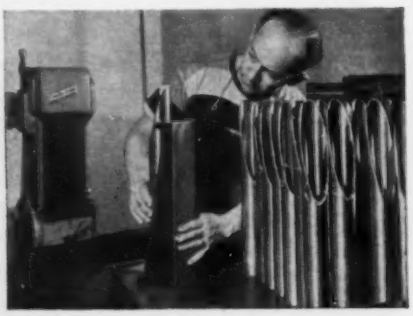


1 PRODUCTION PROBLEM:

To speed production and cut unit costs of grinding rough-sawed ends of stainless steel blast tube receivers for jet aircraft. Christensen Tool & Engineering Co., had to knock off the razor-sharp burrs caused by sawing, and also grind the end to the tube contour.

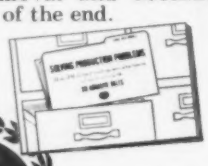
2 SOLUTION:

A 3M Representative suggested that this Norwalk, Connecticut, manufacturer switch to the 3M Method, using "Wetordry" Three-M-ite Cloth belts, running wet over a platen sander. This method met the firm's need for rapid stock removal and accurate, smooth shaping of the end.



3 RESULTS:

An immediate production increase of 300%—from 25 to 100 pieces per hour. And the company found they could finish between 300 and 400 pieces with one belt! A 3M Representative can help you solve your grinding problems, too. His services are available without cost or obligation.



3M ABRASIVES

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure-Sensitive Tapes, "Scotch" Sound Recording Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

WANT MORE INFORMATION?

MINNESOTA MINING AND MFG. CO.
Dept. IA-5134, St. Paul 6, Minn.

☐ Send me free booklet describing actual 3M Abrasive belt installations.
☐ Have 3M Representative call.

*Name*_____ *Title*_____
*Company*_____
*Address*_____
*City*_____ *Zone*____ *State*_____
*My Distributor is*_____

sloped bottom of the box and collects at the hinge-end. The truck stops at the oil tub, tilts forward, and drains oil into the tub.

Some scrap, of troublesome length, won't fit into boxes. The Union Metal Mfg. Co. uses another Work-O-Matic unit in their own plant for such materials as bar cut-offs, shear trimmings, and blanking skeletons. This unit is the Multi-Duty Tray.

Trays Save Space

The corrugated steel tray is 16 in. deep, 72 in. long, and 35 in. wide. A sloped back serves as an extended lip to gather falling pieces as they are generated. The trays, equipped with leg-locking blocks and skids, are safely tiered to save storage space.

A fork-lift truck with auxiliary hydraulic lifting mast easily dumps the tray. The truck operator lifts the tray to any desired height within the range of his lifting mast. A hooking device on the auxiliary mast engages a bale at the rear of the tray. The operator raises his auxiliary mast, which lifts the back of the tray, spilling the contents into a truck or gondola car. As the tray is returned to normal position, it pushes any stray pieces off the truck forks.

Grinding:

New machine has larger working area.

Larger working area and design features which permit ready factory incorporation of modifications for automatic flat or crush form grinding operations have been combined in new surface grinder.

The new grinder, developed by the DoAll Co. of Des Plaines, Ill., offers tool and die shops a larger surface grinder which can also be adapted for production applications.

Saves On Setups

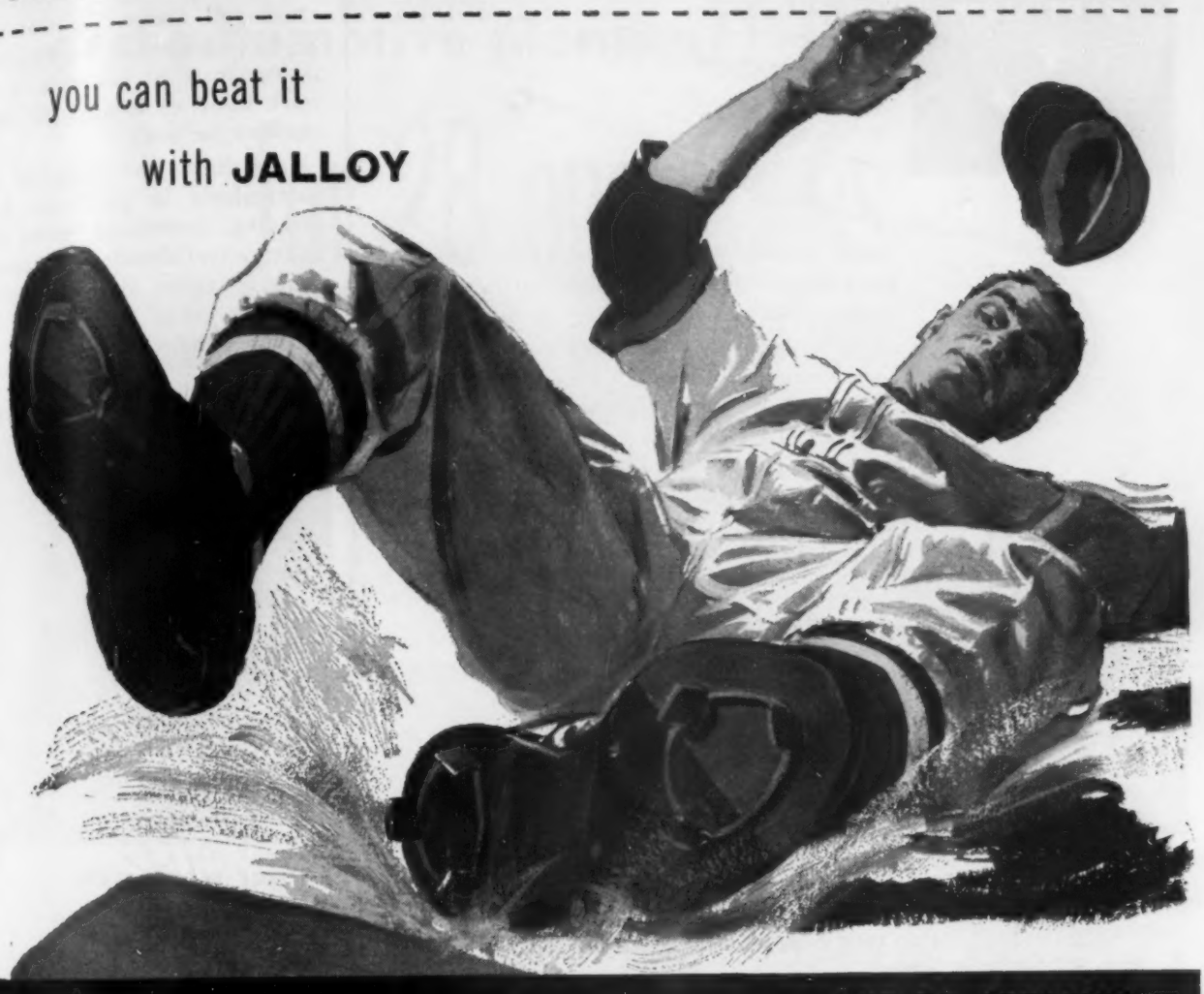
On form grinding, manual or automatic, the large work capacity of the new model permits the

Turn Page

FACING A TOUGH PROPOSITION?

you can beat it

with **JALLOY**



J&L JALLOY HEAT-TREATED PLATE BEATS WEAR DUE TO ABRASION

Jalloy lowers maintenance costs on coal conveyors

Jalloy provides longer wear with less repair in truck bodies

Jalloy Plates outlast other steels by margins of 4 to 1

Jalloy Aprons in Tyrock screen last 3 times as long as other steels

J&L Jalloy Heat-Treated Plate is the general purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded. Jalloy is available in three grades to meet various service requirements.

J&L STEEL

Jones & Laughlin

STEEL CORPORATION — *Pittsburgh*

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 403, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

Name_____ Title_____

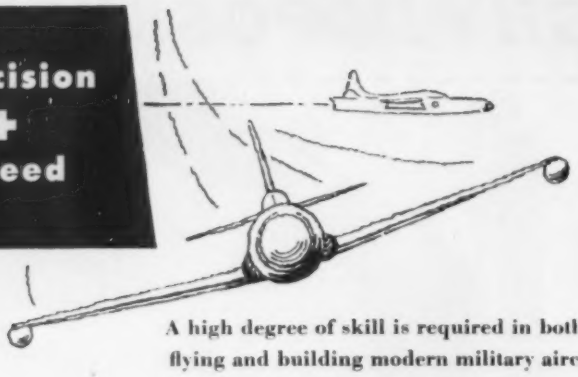
Company_____

Address_____

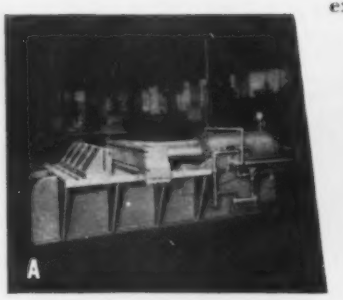
_____

UNIVERSITY OF MICHIGAN LIBRARIES

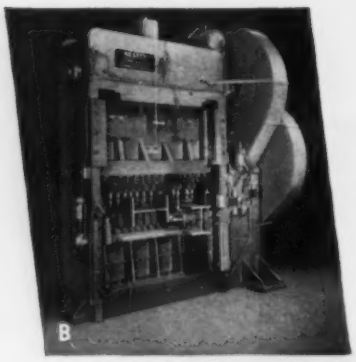
precision + speed



A high degree of skill is required in both flying and building modern military aircraft. BEATTY machines, like the latest of the supersonic jet jobs, are precision-built to afford maximum accuracy and speed in metal frabicating operations. Let a BEATTY engineer analyse your industrial machine needs—if one of the machines shown doesn't answer your production problem, we'll design and build one to your exact requirements.

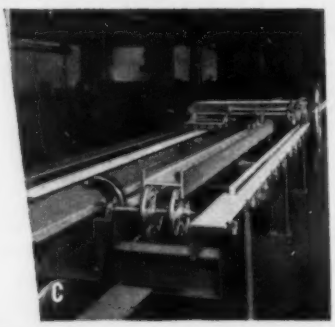


A. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

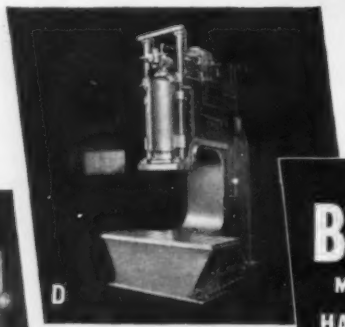


B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

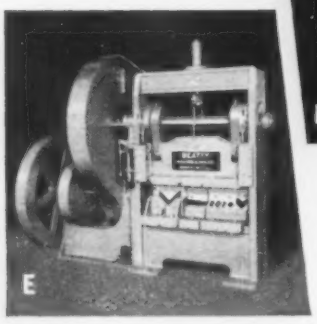
C. BEATTY Spacing Table handles web and flange punching without roll adjustment.



D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.



E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

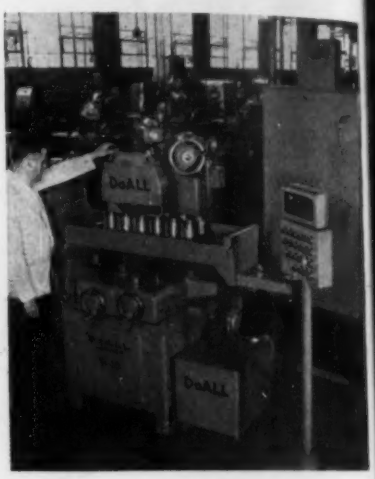


BEATTY
MACHINE & MFG. CO.
HAMMOND, INDIANA

—Technical Briefs—

crush roll dresser or other kind of form dresser to be positioned permanently at the ends of the work table while adequate space remains for work.

In ordinary form grinding, and particularly in production form grinding, operations where frequent wheel dressing is required, time is saved since the initial dressing setup remains on the grinder eliminating re-setups.



Larger work area . . .

Copper:

Copper-lined room at GE plant excludes electromagetic wave

A completely copper-lined room, believed to be the largest in the world with this type of surface covering, will soon be a part of the test and research facilities of the General Electric Co.'s transformer plant at Pittfield, Mass.

A total of 20,900 lb of copper sheeting was used to cover floor, walls, and ceiling of this room—the anechoic chamber of a new $1.5 million sound test building at the GE plant. The chamber is 68 ft long, 58 ft wide and approximately 60 ft high.

Acts As Shield

Principal purpose of the copper is to provide a shield for keeping electromagnetic waves of external origin out of the room. Concrete, masonry, and fiberglass wedges, as

Turn Page

at one of the world's largest automotive plants 37¼ seconds for 28 operations

JOB FACTS:

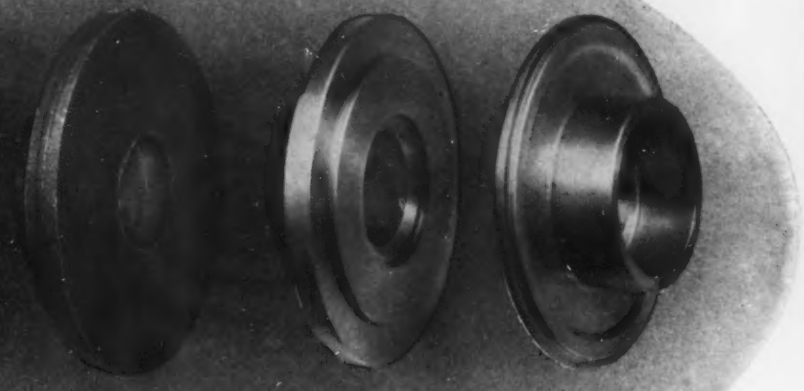
PART.....Torque Impeller Hub.
SIZE.....4" diam. 1¼" long.
MATERIAL.....Steel forging, SAE 1146 annealed
MACHINES: 6 inch model RPA-8 Acme-Gridley Chucking Automatics.

1ST MACHINE, with double index and duplicate tooling finishes 2 pieces per cycle—each with 11 identical operations. All carbide tooled.

Machine Time: 22½ seconds—320 per hour.

2ND MACHINE, single index with one set of tools completes opposite side to 17 operations. All carbide tooled.

Machine Time: 26 seconds—138 per hour.



WITH 100% CARBIDE TOOLING ON 8-SPINDLE

Acme-Gridley Chucking Automatics

IN this most competitive big business all planning must be toward higher consumer acceptance in both quality and purchase price—and leave a profit for the effort.

All three of these prime essentials begin with small parts such as these and hundreds of others made on multiple spindle chucking automatics.

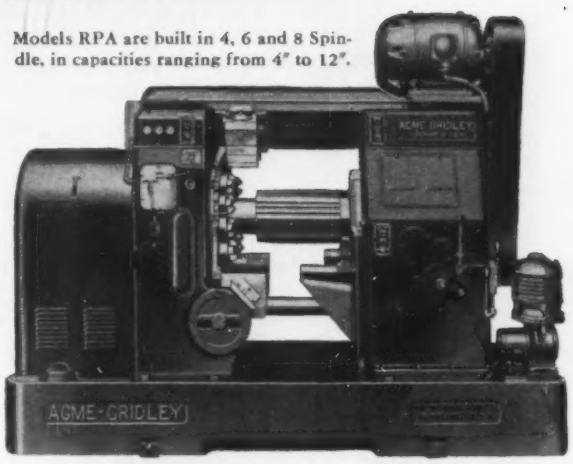
Alert, continuous and critical study is given to the most minute detail for manufacturing improvements, accepting only those which will:

- **save a fractional second in time per piece**
- **avoid rehandling on extra machines**
- **release valuable floor space**
- **relieve costly man-hours for other work**

—all to the end of achieving better components at lowered factory cost.

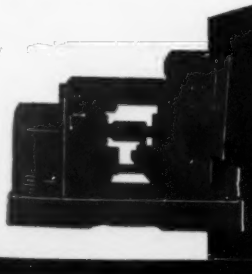
For more than 20 years Acme-Gridley machine design engineers and tooling specialists have helped meet these vital needs—by improving basic machine stamina, by ingenious applications of fastest cutting carbide tools, by simplifying operator effort. All of which applies to multiple chucking operations and to bar machine performance.

Models RPA are built in 4, 6 and 8 Spindle, in capacities ranging from 4" to 12".



Regardless of the particular kind of mass production parts, let us show you how to put Acme-Gridleys to work in your plant—MORE PROFITABLY.

Remember—your market also must be protected against competition if you expect to make a profit.



The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS

1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing

UNIVERSITY OF MICHIGAN LIBRARIES

Heavy Steel-Plate Baking Pan

SHEET METAL FABRICATION by KIRK AND BLUM

Drawn Steel Pans

There are no limits on size, quantity, shape or intricacy at Kirk and Blum. With 47 years of experience, Kirk and Blum meets your requirements in sheet, plate and alloy fabrication quickly and economically.

Complete facilities to ½" capacity for square or rotary shearing, braking, forming, rolling, punching, riveting, welding, grinding, drilling and finishing sheets, light plate and structurals. For complete details, write for new bulletin or send your prints.

THE KIRK AND BLUM MANUFACTURING CO.
3200 FORRER STREET
CINCINNATI 9, OHIO

Write for 40-page Booklet

KIRK AND BLUM
METAL FABRICATION

We Bring Your Prints to Life

Industrial X-ray Cabinet

—Technical Briefs—

Chamber will be free of outside noise, radio interference . . .

well as copper, are being used in the chamber's 4½-ft thick walls.

These will keep the chamber almost totally free of outside radio interference and noise, providing an ideal place for the study of these factors in apparatus.

Research in the sound test building is expected to show how to reduce noise in transformers and to insure that future transformer improvements will not result in pronounced radio interference.

Base For Tests

Tests for radio interference will be conducted in the radio and television range beginning at 550 kc. Specifications call for at least a 100 to 1 attenuation at approximately one megacycle. Noise and vibration tests conducted in the chamber will be accurate to ½ db, according to GE engineers.

The amount of copper used in the room, if transformed into ordinary house wire, would stretch a distance of 319 miles or from Boston to Philadelphia via New York. To connect the copper sheeting, 12,130 ft of soldering was done and a half ton of solder was used. The sound test building is expected to be completed early this summer.

Slitting:

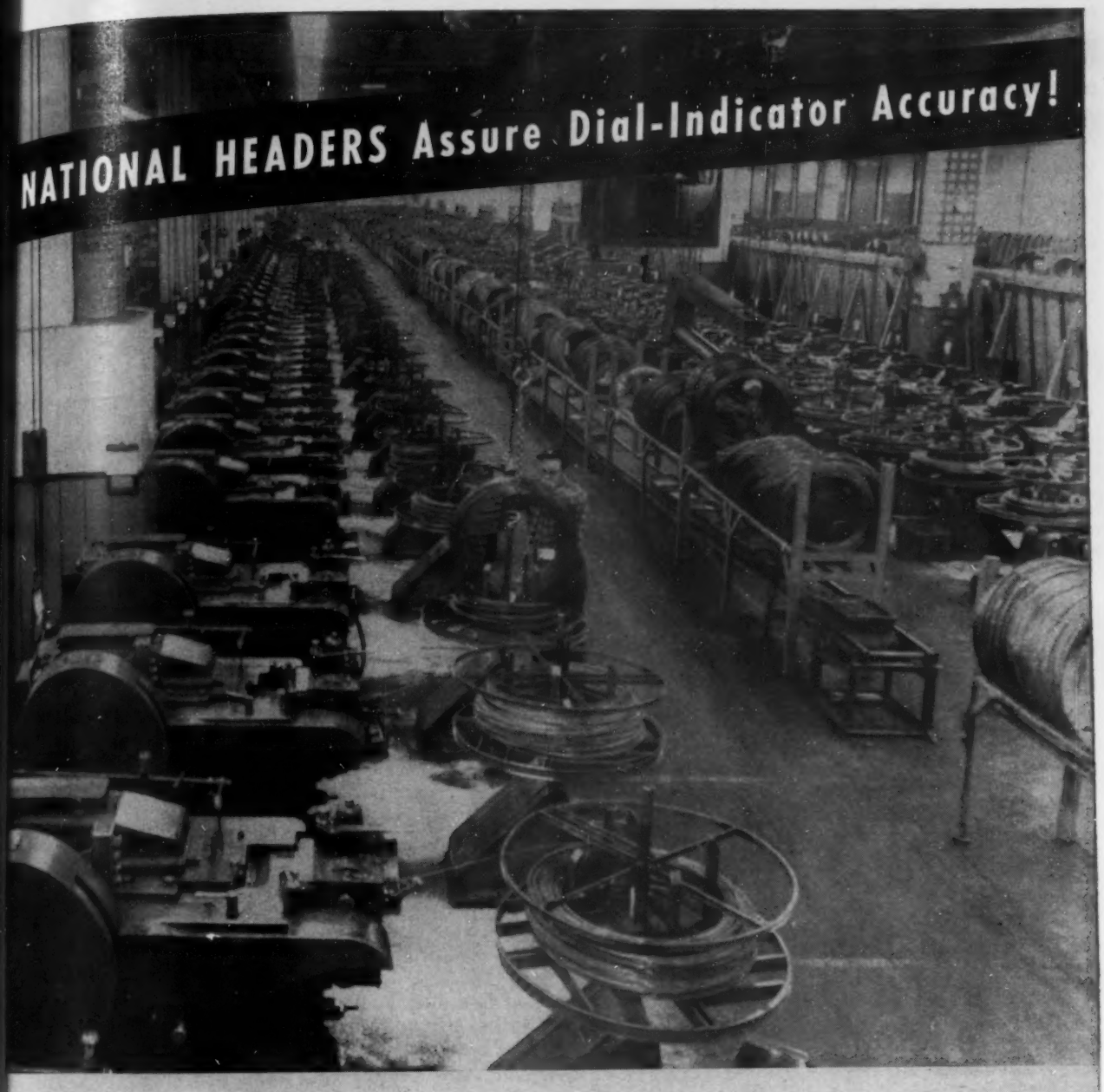
New precision coil slitting machine cuts materials costs.

A new machine for slitting and edge rolling with as little trim or waste as the thickness, or less than the thickness of the steel, has been designed and built by the J. L. Golding Mfg. Co. and is now being used by Economy Steel Service Co., Chicago.

With the new machine, Economy Steel has been able to produce work previously considered impossible. A quantity of coil steel was slit by one of the warehouses to 15/16 in. wide.

Turn Page

NATIONAL HEADERS Assure Dial-Indicator Accuracy!



This efficient and highly productive Header Department of The American Screw Company, Willimantic, Connecticut . . . 116-year-old leading producer of Wood, Machine, and Tapping screws with either Phillips Recessed or Slotted Heads . . . produces thousands of gross of fasteners daily.

American Screw relies upon its large batteries of National Cold Headers to give day-after-day quantity and quality production.

If you have a forging problem . . . large or small, hot or cold, ferrous or nonferrous . . . let us help you solve it. Send us prints, or a sample part, or better yet, visit us. No obligation.

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago

UNIVERSITY OF MICHIGAN LIBRARIES

This material was later found to be 0.0065 to 0.008 in. wider than normal slitting tolerance. Economy Steel reworked these coils and slit 0.008 in. from them, reducing the coils to the *exact* width required.

In another case a large quantity of slit coil steel, obsoleted because of an engineering change, was slit into two strips.

Both were the required width, even though there was no trim allowed in order to accomplish this. This slitting was held to a ±0.003 in. with no resulting camber.

Edge Rolling Simplified

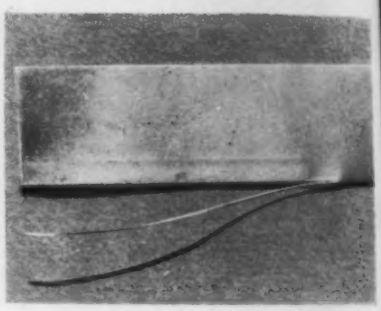
Edge rolling of light gage metals has always presented a major problem. The new equipment handles this operation as a routine job.

The customary or average waste resulting from slitting is between ⅜ and ½ in. Elimination of this waste can become a substantial saving, particularly in the case of high cost metals as stainless steel, aluminum, brass and bronze.

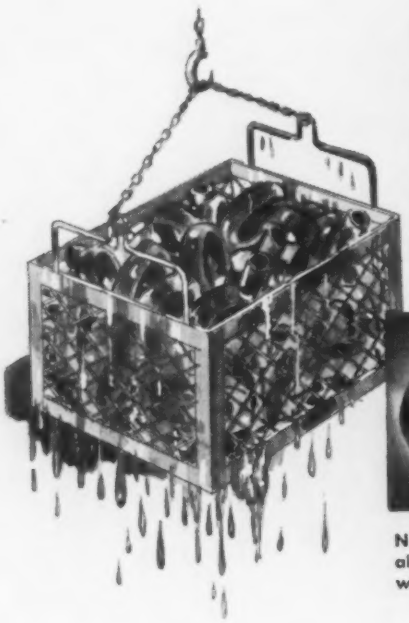
Slitting of narrow coils with a drop-off or scrap equal to the thickness of the metal often more than equals the cost of slitting.

Slit coil stock, which because of die or model changes has become obsolete, may be made usable at relatively low cost.

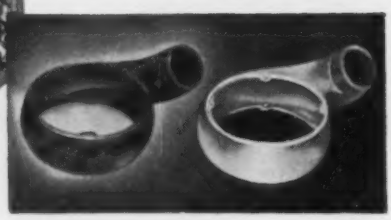
Machine in operation . . .



. . . 0.0095 in. steel trim



FOR A TROUBLE-PROOF FINISH— START AT THE BOTTOM!



No buffing compound remains after this aluminum casting has been precleaned with a Magnus Emulsion Cleaner.

Removing buffing compounds or oily dirt films from metal surfaces is easily accomplished by precleaning with a Magnus Emulsion Cleaner. A simple dip or spray penetrates the grime, loosening it for easy removal with a water rinse.

Magnus Emulsion Cleaners are non-toxic, non-corrosive and have no unpleasant fumes. Cleaning is safe, dependable and economical.

A demonstration will open your eyes to the improvements in quality and the reduction in cleaning costs offered by Magnus Emulsion Cleaners. Write for information—no obligation, of course.

magnus

MAGNUS CHEMICAL CO., INC.
46 South Ave., Garwood, N. J.
In Canada: Magnus Chemicals, Ltd., Montreal
Service Representatives in Principal Cities

Testing:

Develop improved method of testing steel for hydrogen.

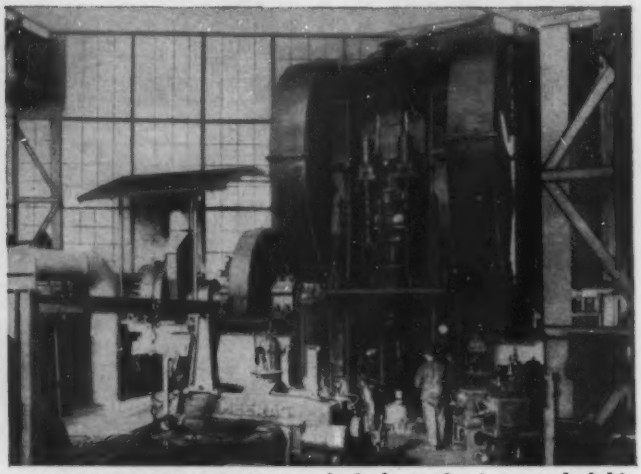
An analytical process which shows promise of being fast enough and accurate enough to study hydrogen during steelmaking has been installed at the United States Steel Research and Development Laboratory, Pittsburgh, Pennsylvania.

D. J. Carney, Chief Development Metallurgist at U. S. Steel's South Works, with J. Chipman and N. J. Grant, both members of the faculty of Massachusetts Institute of Technology at Cambridge, Massachusetts, developed a vacuum-tin-fusion method of analysis for hydrogen.

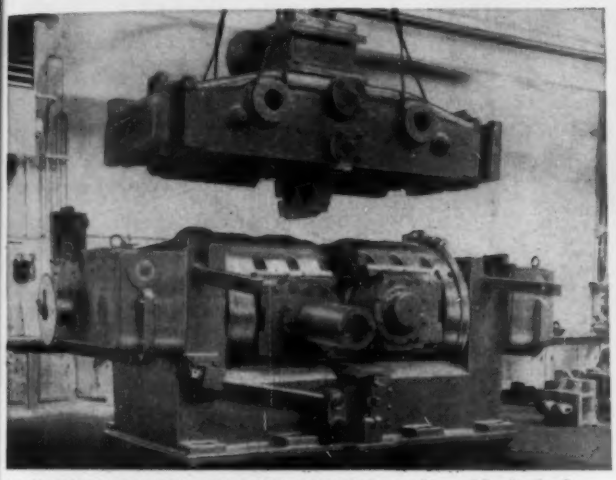
Turn Page

New mill machinery speeds seamless tube production

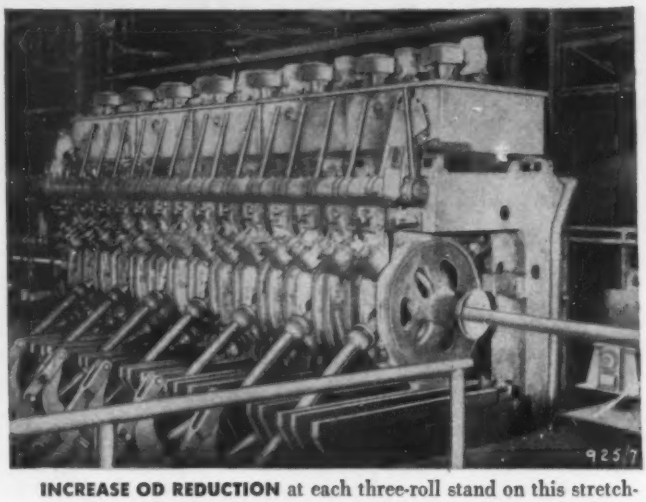
HIGH OPERATING SPEED of Mannesmann-Meer automatic return mill boosts production, cuts costs in any automatic mill plant. Special guides in mandrel bed aid quick changeover of schedules.



180 STEEL TUBES PER HOUR — that's the production record of this mechanical extrusion press. We also offer high-speed hydraulic extrusion presses for the non-ferrous industries.



HEAVY-DUTY REELER WITH ROLL OBLIQUITY adjustable in both planes, has individual motor drive for each roll. Permits use of a plug of any taper for any desired expanding action. All Mannesmann-Meer reelers are extra heavy and rugged in construction with anti-friction bearings throughout to assure best possible rolling conditions.



INCREASE OD REDUCTION at each three-roll stand on this stretch-reducing mill. New low-cost group drive permits speed adjustment for each stand. Special stand changing device provides for quick schedule change. These same features are available for continuous mandrel mills. Many outstanding design features are also available for both sinking and sizing mills.

Got production bottlenecks on seamless tubes?

At Mannesmann-Meer you'll find complete mills or mill machinery designed and built specifically to speed production and cut costs.

We're the *only* manufacturer of tube mill machinery who can draw on over 65 years of experience in the *operation* as well as the design of complete seamless mills. Let us put this production and engineering know-how to work for you.

Examples of some of our new developments in mill machinery are shown here. Mechanical and hydraulic extrusion presses — piercing mills — automatic return (plug) mills — continuous mandrel mills — heavy-duty reelers — assel mills — pilger mills — expanding mills — sizing mills — stretch-reducing mills — large electric weld pipe mills — rotary straighteners — tube reducing machines — are but a few of the many products in our complete line.

MANNESMANN-MEER

ENGINEERING & CONSTRUCTION COMPANY
900 Line Street, Easton, Penna.

WORLD SPECIALISTS IN HIGH-SPEED TUBE-MILL MACHINERY

UNIVERSITY OF MICHIGAN LIBRARIES

Shipper Hits Savings Jackpot with new Unitizing Method!

A Signode unitizing method that can work for you!

Shipping textile machine parts always was costly for one manufacturer until he called in a Signode fieldman. A new strapped Unit-Pack was designed and tested—and the manufacturer soon realized that he had hit the jackpot in savings! He saved

74.2% in labor **74.0% in overhead**
57.7% in materials **55.2% in container cost**
26.0% in freight

Here's the story: The manufacturer was shipping two cylinders for spinning or twisting frames in a heavy wooden crate. Becoming conscious of shipping costs, he sought a way to reduce this expense. The Signode fieldman offered the solution—a double carton secured with tensional steel strapping.

Unitizing your shipments with steel strapping may turn expense into profits—damaged goods to safely delivered goods. It costs you nothing to find out what can be done. Send for our folder showing 6 *BASIC* WAYS OF UNITIZING!

SIGNODE Steel Strapping Co.

2623 N. Western Ave., Chicago 47, Ill.
In Canada: Canadian Steel Strapping Co. Ltd., Montreal • Toronto
Offices coast to coast—Foreign Subsidiaries and Distributors World-Wide

—Technical Briefs—

This method has recently been modified by B. M. Shields, Chief Development Metallurgist of U. S. Steel's Duquesne Works, with cooperation of Professors Chipman and Grant, so that gases evolved from a steel sample can be analyzed for hydrogen by means of a thermal conductivity cell.

Cuts Analysis Time

The new technique makes possible the analysis of a properly prepared sample in about 15 minutes with a probable error of only plus or minus 0.12 parts per million.

The improved method is applicable to the analysis of multicomponent mixtures when all gases in the mixture except one have nearly the same thermal conductivity. Fortunately, the mixture of hydrogen, nitrogen and carbon monoxide evolved by the tin-fusion analysis falls into this classification.

Thermal Conductivity Compared

The thermal conductivities of nitrogen and carbon monoxide are practically equal, while that of hydrogen is approximately seven times that of the other two gases. Thus, the thermal conductivity of the mixture at known temperature and pressure can be related directly to the percentage of hydrogen by suitable calibration.

Absorbed hydrogen has an embrittling effect on steel without increasing the tensile strength, even when present in such minute quantities as 3 parts per million.

Apparatus Used

The apparatus for detection and measurement of hydrogen consists of a closed system of glass tubes with mercury cut-offs to control the gas flow, an induction furnace, two mercury diffusion pumps, a McLeod gage, a conductivity cell and a ½-hp mechanical vacuum pump to extract air from the system.

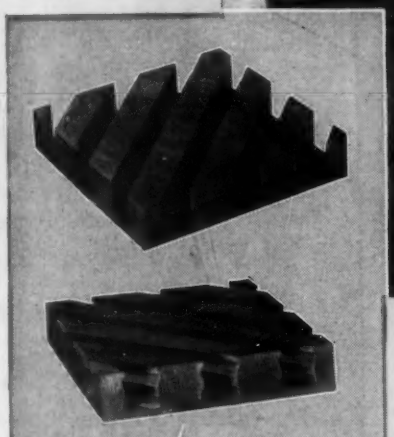
Measurements of conductivity are dependent on a precision ammeter with a range of 0 to 1.00 amp which, with the conductivity cell, is tied into an electrical thermal conductivity bridge activated by four 1½-v dry cells.

Turn Page

90 pieces per hour

...on this CINCINNATI SHAPER

Photograph courtesy Printing Machinery Company, Cincinnati, Ohio.



Work piece is a malleable iron, Warnock diagonal block. Production, 90 per hour. Special designed gang tool holder carries six form ground high-speed tools.

This production job on a special Cincinnati Shaper is finished in one completely automatic cycle. Both initial cost and tooling costs are low.

The operator starts the Shaper; the head automatically feeds nine strokes to the right, nine to the left and stops. The operator indexes the fixture and the cycle repeats. Loading and unloading is done without interruption to cutting.

Consult us on your shaping jobs. A special Shaper may be very profitable to you.

Write for
Shaper Catalog N-6.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

UNIVERSITY OF MICHIGAN LIBRARIES

NEW!

BART LECTRO-CLAD NICKEL-PLATED Steel Plate and Sheet

for fabricating into products demanding corrosion and contamination control.

Nickel plated on either or both sides by the electro deposition of pure nickel which provides a permanently bonded, ductile and pore-free cladding up to .020" thick. Produced with a new plating technique developed by BART MANUFACTURING CORPORATION and now available in sizes up to 7 feet x 20 feet.

★ LECTRO-CLAD Plate and Sheet suitable for fabrication into all types of storage tanks, chemical processing vessels and other equipment and installations where corrosion or contamination problems exist.

★ THICKNESS OF CLADDING can be supplied to particular requirements and not necessarily governed by the thickness of the steel plate over which it is applied.

★ ALL RELATED WELDING techniques perfected. No special equipment required.

★ LECTRO-CLAD Plates and Sheets withstand heating, forming, bending and other fabricating processes without change.

Write to Dept. IA-5 for details.

LECTRO-CLAD PLATE is the direct outgrowth of the successful patented BART PROCESS for nickel-lining of seamless steel pipe and fittings.

BART LECTRO-CLAD

BART MANUFACTURING CORPORATION
229 Main Street • Belleville 9, New Jersey
Exclusive territories available to qualified distribution organizations

DoALL ADJUSTABLE THREAD RING GAGES

remain *perfectly* round through full range of adjustment and retain setting while in use.

2½ to 12 times longer life— over 50% less weight than conventional gages

Also Thread Plug Gages, Cylindrical Plug and Ring Gages, and Master Setting Discs

Consult your classified phone directory for nearest of 38 DoALL Service-Stores stocking gages, cutting tools, supplies.

15

Call Your DoALL Service-Store

Machine Tools • Cutting Tools • Measuring Instruments
Shop Supplies • In Stock

The DoALL Company, Des Plaines, Ill.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

—Technical Briefs—

Test sample is placed in furnace and fused with pure tin . . .

A steel sample to be tested is placed in the previously evacuated induction furnace and is fused with pure tin. Mercury vapor in the diffusion pumps forces the gases from the furnace into a tube from which they escape into a chamber of known volume.

They are then conducted into a McLeod gage by which the pressure of the gases is measured. To eliminate stratification, the gases next pass through a mixing chamber.

Material Reworked

From the mixing chamber the gases enter the thermal conductivity cell. The bottom section of the cell is made of pyrex tubing with a closed bottom and a ground joint on the top. A thin piece of pure platinum wire is suspended in the center of the cell from nickel wire supports.

The wire is held taut by a small tungsten spring. The nickel supports are welded to the tungsten rods used to conduct the current into the cell through a glass-metal seal.

Electrical leads from the modified Wheatstone bridge circuit are attached to the tungsten rods. The entire cell up to the glass tube lead-in is maintained at 0° C by immersion in an ice and water bath.

Balanced With Platinum

The current is turned on and the bridge circuit is balanced with the platinum wire held at a temperature of 25° C. The ammeter reading, indicating the amperes necessary to hold that temperature, is a measure of thermal conductivity of the gas mixture in the cell.

This reading is then compared to a calibration previously prepared by using gas mixtures containing various known percentages of hydrogen from 100 to 0 pct. The comparison gives an accurate analysis of the hydrogen present in the mixture.

The over-all precision of analysis by the thermal conductivity method was evaluated by the use of dupli-

Turn Page

80% saving on lubrication costs

by just letting Pure Oil help them SIMPLIFY AND SAVE!

HERE'S HOW YOU CAN SAVE

1. **Reduced inventory**
2. **Simplified inventory control**
3. **Reduced labor cost**
4. **Reduced errors in application**
5. **Simplified lubrication**
6. **Speeded-up purchasing**

• • •

Be *sure* with Pure. Sales offices located in more than 500 cities in Pure's marketing area.

When a West Virginia coal mine found they were spending more than 5¢ per ton for lubrication, and loss of tonnage through breakdown was even more, they called in Pure Oil.

Within six weeks Pure Oil engineers had cut the cost down to 1¢ per ton (a savings of 80%). How? By selecting lubricants better suited to protect the machinery and, by setting up a lubrication program based upon a survey. Reducing the number of lubricants from seven to four resulted in smaller inventory and less waste. An unusual case, to be sure. Yet sizable savings have been accomplished in all types of mines, mills and factories by similar Pure Oil methods.

Send for this *free* booklet which tells you how you can *Simplify and Save* on lubrication, too!

IT STARTS HERE

PURE OIL INDUSTRIAL LUBRICANTS

FREE BOOKLET

The Pure Oil Company, Industrial Sales Dept. I-45
35 E. Wacker Drive, Chicago 1, Illinois
Please send me your free booklet on how to "Simplify and Save"

NAME_____
POSITION_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE____

UNIVERSITY OF MICHIGAN LIBRARIES

SHENANGO Centrifugal CASTINGS ... KEY TO SAVINGS

Precision-machined by Shenango for paper making machinery are these two centrifugally cast bronze wire stretch rolls with Meehanite Metal heads and steel journals. Note the special water slinger ring on the head.

Shenango methods ...Your gain!

SHOWN above are 15-foot wire stretch rolls of centrifugally cast bronze. From end to end, inside and out, these and all Shenango centrifugal castings are uniform in high quality.

The carefully controlled centrifugal casting process developed by Shenango assures exceptionally fine pressure-dense grain and freedom from costly imperfections. For you, these features mean trouble-free performance and wear resistance, minimum maintenance, and the ability to withstand abnormal loads and speeds. Yes, increased savings from every angle.

Shenango is prepared to supply either rough castings, semi-machined or precision-finished parts and assemblies in either ferrous or nonferrous metals. For further information and data on meeting specific needs, write to . . .

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO
COPPER, TIN, LEAD, ZINC BRONZES · MONEL METAL
ALUMINUM AND MANGANESE BRONZES · NI-RESIST · MEEHANITE METAL

cate samples. Each of 10 samples was cut in half to provide 10 sets of duplicates.

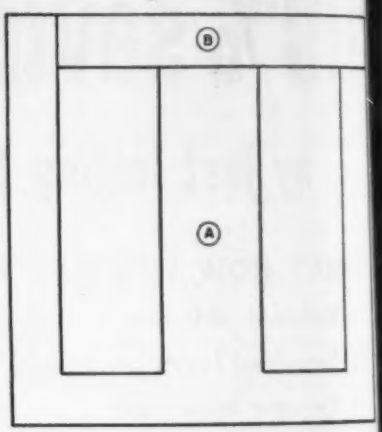
A statistical study of the data obtained from these 10 pairs shows the standard deviation of the error of observation to be plus or minus 0.17 parts per million, with the probable error plus or minus 0.12 parts per million.

Using the statistical criterion of three standard deviations, a maximum error of 0.5 parts per million is possible, although the frequency of such an error will be extremely low.

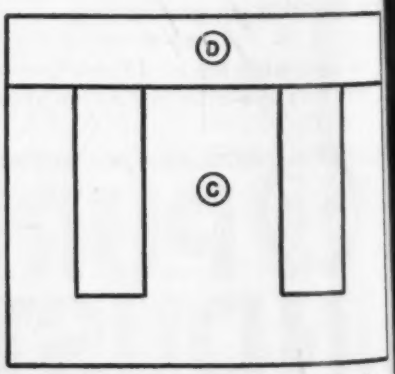
Design:

New scrapless laminations reduce transformer weight.

A new design for scrapless laminations used in shell-type transformer cores has been developed by the Armour Research Foundation of Illinois Institute of Technology.



ASSEMBLY of new scrapless lamination, one layer.



ASSEMBLY of conventional scrapless lamination, one layer.

Turn Page

Black & Decker
Cases for Comment

MAINTENANCE

(Case History 8168)

Removing rust fast with wire brush and versatile B&D Portable Grinder

CONSTRUCTION

(Case History 10634)

1616 houses built at 2-a-day rate... thanks to B&D Heavy-Duty Saws

PRODUCTION

(Case History 10691)

20% more production 20% faster...it's a Black & Decker Drill

Photo shows drilling of 10 gauge steel for Victor Furnace. Manufacturer reports use of B&D Drill resulted in 20% speed up, 20% production increase. Drills standing up very well after 8–10 years use...8 hrs. a day...5½ days a week.

Jack-Sure shows long trouble-free service

SMALL DRILLS. Typified by "handful of power" ¼" Heavy-Duty Holgun.* Ideal production tool. Exceptional in "close-corner" drilling.

LARGER DRILLS . . . Models and speeds to fit any job in capacities from ¼" to 1¼" in steel, double in hardwood.

SCREW DRIVERS . . . Drive anything from delicate screws to large nuts and bolts. Many models, positive and adjustable clutches.

SANDERS . . . Drive abrasive discs, wire cup brushes, saucer grinding wheels, other attachments. Four models, 7" and 9" capacities.

BENCH GRINDERS . . . Three models, 6"—10" wheel diams., ¼ to 1 H.P., for sharpening, grinding, wire brushing, buffing.

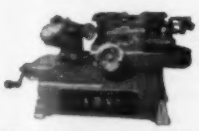
POLISHERS . . . Clean, polish, seal in *one* operation. Three models including unit with *exclusive* automatic polish feed.

HAMMERS . . . Drive star drills, bull points, etc., in masonry, other materials. Four models, ½" to 2" hole-capacity in concrete.

PORTO-SHEARS* . . . For fast, accurate cutting of ferrous and nonferrous sheet metal. Two models, 12 & 16 gauge capacities in steel.

VALVE SEAT GRINDERS . . . Famous "Vibro-Centric"* action puts a mirror finish on internal combustion engine valve seats in seconds.

PORTABLE GRINDERS . . . Bring the tool to heavy, bulky, hard-to-move work. Perfectly balanced. 3", 5" and 6" wheel diams.



VALVE REFACERS . . . Speedily grind factory-accurate angle on valve faces. Also grind valve stems, tappets and rocker arms for exact clearance.

FACTORY SERVICE . . . A B&D *extra!* Nationwide company-operated branches within 24 hours of *any* customer provide fast, accurate service at reasonable cost!

Industry reports prove . . . for increasing production . . . speedier construction . . . easier maintenance . . . *at lower cost* . . . it's hard to beat Black & Decker Power. They find that in every B&D Portable Electric Tool they get just the right power to do the job.

And they can be sure of getting this right power in B&D Drills, Screw Drivers, Saws, Grinders, etc., because Black & Decker custom builds its own motors. These motors, plus husky housings and precision parts, mean you get a tool that's easy to work with and hard to hurt. In every B&D Tool you have a real time-, trouble-, money-, and manpower-saver.

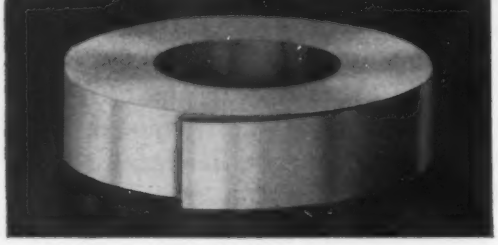
Want more information? Then ask around your industry . . . your own shop. Call your B&D Distributor for demonstration. And write for your copy of the complete *1954* B&D catalog. Address: THE BLACK & DECKER MFG. CO., 603 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker
PORTABLE ELECTRIC TOOLS

* Trade Mark Reg. U. S. Pat. Off.

COLD ROLLED STRIP



• True strip gauge tolerance • Uniform quality • Controlled tempers and finishes • Specialty steel service from mills

When you specify Follansbee Cold Rolled Strip, you get more than just the width you require. You're also sure of true strip gauge tolerance and uniform quality, as well as the right temper and working qualities necessary in your press operation.

Follansbee Cold Rolled Strip offers you many advantages. Consult your Follansbee Steel Representative about the quick, personalized service you get directly from the Follansbee Mill. His suggestions can be of real help.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

Polished Blue Sheets and Coils • Seamless Terne Roll Roofing • Cold Rolled Strip

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee, Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, West Virginia

FOLLANSBEE METAL WAREHOUSES: Pittsburgh, Pa., Rochester, N.Y., Fairfield, Conn.

New design has larger window space . . .

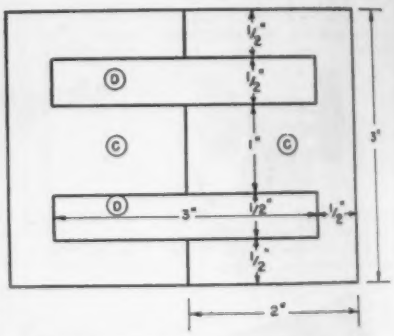
Chicago. The new lamination will result in transformers lighter in weight than those made with conventional scrapless laminations.

Another advantage is that better joints can be obtained because of the way the lamination goes together, thus giving lower no-load current.

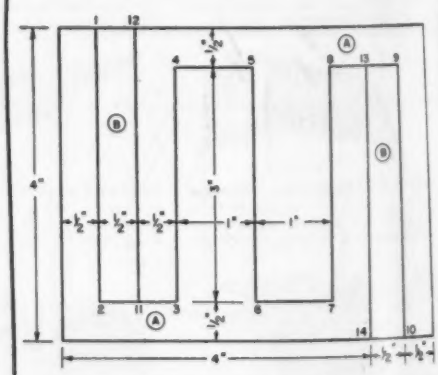
Larger Window Space

The new design has proportionately larger window space (open area) than ordinary laminations. This feature should be particularly useful in high-voltage applications where more core window space is required.

Scrapless laminations are designed so they can be punched from sheets or rolls of magnetic steel without any scrap. The new design is not intended to replace previous designs but to supplement them in certain applications.



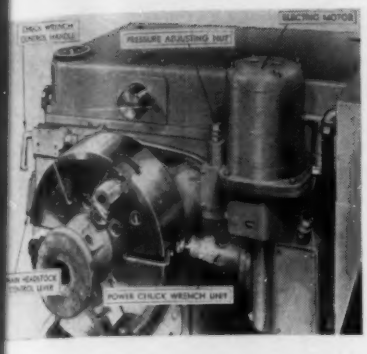
CONVENTIONAL scrapless laminations for shell type cores as cut from sheet magnetic steel.



NEW SCRAPLESS lamination for shell-type cores as cut from sheet magnetic steel.

NEW EQUIPMENT

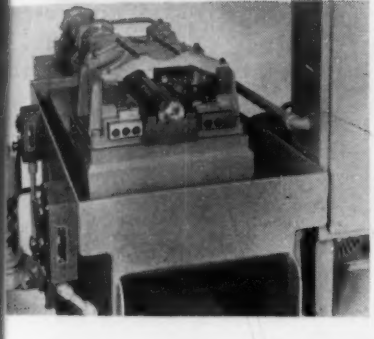
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 141 or 142.



Power chuck wrench unit is a work-saver

On the new line of W&S heavy duty turret lathes a redesigned power chuck wrench unit enables the operator to chuck even the heaviest forgings with little effort. An electric motor operating through a controlled torque clutch does the work. A pressure adjusting nut regulates the gripping pressure of a multiple disc clutch with infinite number of settings to grip the heaviest forgings securely, or the most delicate work without distortion. Pistol grip control handle for the chuck wrench is mechanically locked with the main control lever on the headstock of the machine providing complete safety of operation. *Warner & Swasey Co.*

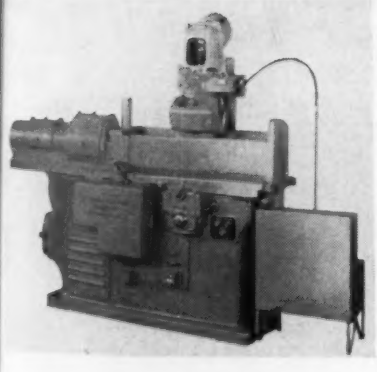
For more data circle No. 33 on postcard, p. 141.



Bearing cap faces broached at 480 per hour

High speed broaching of the locating faces on automotive bearing caps is being accomplished on a special-built horizontal broaching machine featuring two adjustable stationary insert-type broaches. The 4-ton machine has a 12-in. broaching stroke travelling at the rate of 30 fpm. Maximum return speed is 60 fpm. The fixture does not clamp the part; it guides the bearing cap as it is pushed past the stationary broaching teeth by the ram. Fixture may be inverted for broaching different size caps. With each cutting pass, two stationary insert type broaches remove 0.0045 in. of stock. *Colonial Broach Co.*

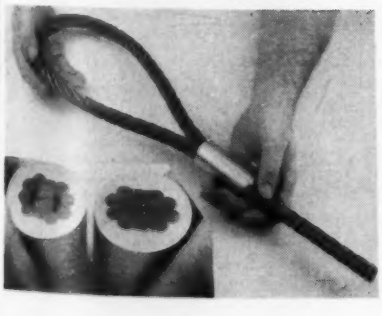
For more data circle No. 34 on postcard, p. 141.



Sharpening machine redesigned for wet grinding

Wet grinding of high-speed steel and carbide-tipped hobs and form-relieved cutters can be done on the redesigned B-C No. 10-12 hydraulic sharpening machine. New wheel spindle and work spindle are fully protected against the effects of coolant. Wheel spindle has been made more rigid for a finer surface finish on the faces of the flutes. All elements of the machine cycle can be accomplished automatically through conveniently-located controls. When proper settings have been made, machine automatically indexes and feeds to remove the desired amount of metal from each flute. Table speed is variable. Automatic controls allow one man to run several machines simultaneously. *Barber-Colman Co.*

For more data circle No. 35 on postcard, p. 141.



Wire rope pressing eliminates hand splicing

Huge savings in time are claimed for a new wire rope pressing system that eliminates hand splicing. Using the system, a worker can make 20 or 30 splices in an hour. The pressing system employs an aluminum alloy clamp or sleeve that is squeezed around the wire rope in a special 300-ton hydraulic press. Called JalKlamp, the device is used as a mechanical method of splicing eyes, with or without thimbles, in the ends of wire rope. This splice gives 100 pct of the breaking strength of the wire rope itself. *Jones & Laughlin Steel Corp.*

For more data circle No. 36 on postcard, p. 141.

Turn Page

UNIVERSITY OF MICHIGAN LIBRARIES

Sunshine State Skyscraper

The modern 22-story South-Central Home Office Building of the Prudential Insurance Company of America will dominate the skyline of fast-growing Jacksonville, Florida. Architects: Kemp, Bunch & Jackson. General Contractor: Daniel Construction Company.

Fabricating Steel is our Business

Ingalls, the nation's leading independent steel fabricator, supplied the steel and is erecting it for the new South-Central Home Office of the Prudential Insurance Company of America. The office building will be the highest in Florida.

Thousands of commercial and industrial buildings, constructed during the past 40-odd years and located in every section of the country, are proof that Ingalls can meet any fabricated steel requirement, regardless of size or location. Plants at Pittsburgh, Birmingham, Pascagoula, Miss., and Decatur, Ala., assure *you* of a service that's prompt, efficient and economical.

FABRICATED STEEL FOR

Power Plants • Hangars
Grandstands • Bridges
Stores • Office Buildings
Theaters • Hotels • Apartment Buildings • Hospitals • Churches
Schools • Industrial Buildings
Tanks • Bins • Pressure Vessels • Stacks

FOR COMPLETE INFORMATION WRITE INGALLS

THE INGALLS IRON WORKS COMPANY

BIRMINGHAM, ALABAMA

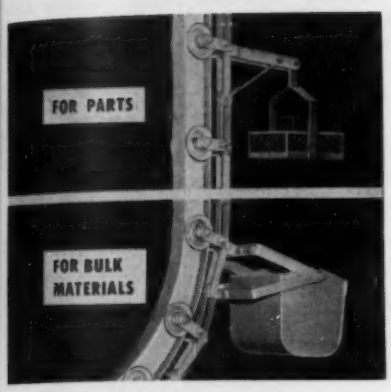
SALES OFFICES: New York, Chicago, Pittsburgh, Houston

PLANTS: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.

Pocket gage measures non-magnetic coatings

The Elcometer is a pocket size thickness gage which measures non-magnetic protective and decorative coatings on ferrous metal bases with accuracy of ±0.0001 in. This 6-oz instrument is not restricted in use to flat surfaces. A locking device permits accurate reading of the scale after measuring an inaccessible area where the scale cannot be seen. Uses no outside power source; can be utilized outside factory or on the production line. Housed in aluminum die-casting. *Ferro Corp.*

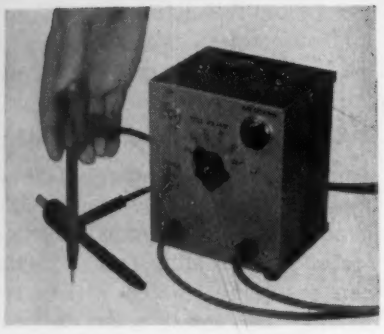
For more data circle No. 37 on postcard, p. 141.



Conveyor costs cut by new bucket hangers

Lower costs are claimed for a new multiplane bucket trolley conveyor with Stif-Arm bucket hanger. The conveyor trolley consists of a single I beam, which may lie in a horizontal, inclined or vertical position, or include sections in all three directions. Conveyor path may have turns in either or both horizontal and vertical planes. A second bracket brace holds the bucket trunnions at a fixed distance away from trolley chain and beam and buckets rotate around their trunnions to remain upright at all times until they reach tipping rollers at discharge points. Buckets are self-loading, self-unloading to handle bulk materials automatically. Wire baskets may be used for parts. *Hapman Conveyors, Inc.*

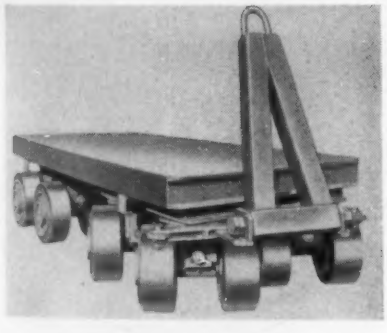
For more data circle No. 38 on postcard, p. 141.



High voltage tester cuts inspection time

Operators inspecting electrical subassemblies for insulation breakdown and grounds may watch their work at all times with the Model 101 tester that gives a buzzer and light signal when rejects are found. Testing prods retract for safety and are designed to prevent wrist fatigue. The unit has an on-off switch, warning pilot light, and pointer knob for selecting any of six common testing voltages between 500 and 2500 v ac. The tester operates from a 115 v, 60 cycle outlet; does not arc-burn plated parts of tested components; takes 4 x 5-in. bench space. *Slaughter Co.*

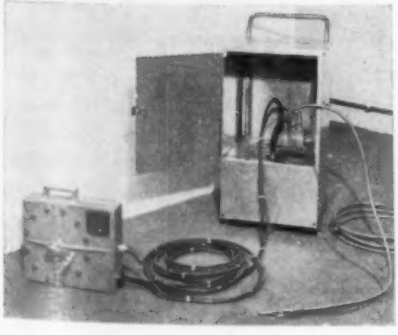
For more data circle No. 39 on postcard, p. 141.



Trailer features synchronized steering

New 16-wheel industrial trailer designed to relieve concentrated floor loadings has articulated axles and a capacity of 60,000 lb. Unique construction feature of the trailer is the quadruple, caster-type, synchronized steering, providing greater stability. Eight articulated axles assure further stability by allowing heavy loads to be carried safely over rough terrain. Built for heavy duty service, deck is ⅜-in. flat steel; bed members are 5-in. channels and I-beams. Solid rubber tires are on semi-steel wheel centers operating on Timken roller bearings. *Phillips Mine & Mill Supply Co.*

For more data circle No. 40 on postcard, p. 141.



Radiographic equipment for internal exposures

The panoramic exposure shield for use in cobalt 60 radiography permits safe handling of strong radioactive sources for three specific requirements: exposures in internal locations; radiography where electric power is not available; panoramic exposures. Two models are available for safe handling 2000 and 4000 millicuries of cobalt 60, respectively. Both consist of three basic units: source shield; source tube; the control cable by which the operator safely exposes the source. The cabinet housing the units is mounted on wheels for easy maneuverability. *Technical Operations, Inc.*

For more data circle No. 41 on postcard, p. 141.

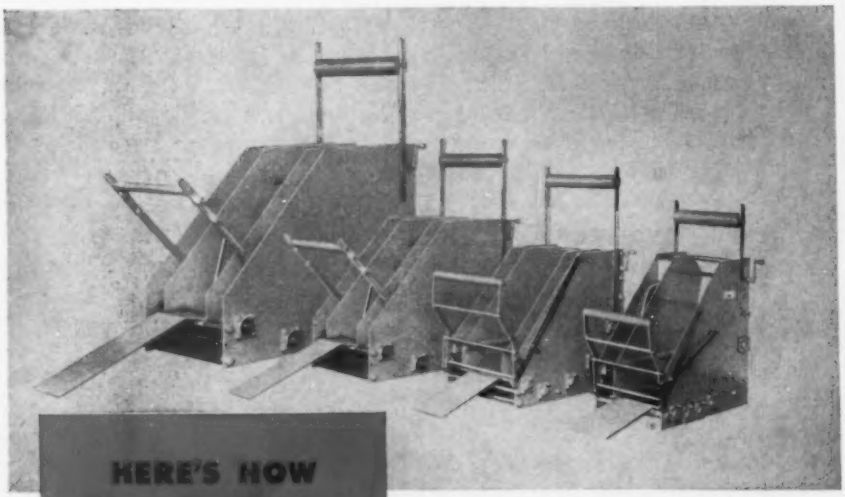
Turn Page

UNIVERSITY OF MICHIGAN LIBRARIES

Permits palletless handling of wooden cases

Industrial trucks equipped with new type clamping device permit palletless handling of wooden cases and similar loads. This truck attachment consists of a standard hydraulic clamp to which have been added a pair of heavy forks. The forks permit clamping various containers and handling of palletized loads in the conventional manner. Sharp, pointed studs on the inner surfaces of the arms or forks insure a positive grip on the load. A front stud on each fork is positioned to permit inverting or dumping a container. The studs make only small indentations in the container and do not damage the contents. *Elwell-Parker Electric Co.*

For more data circle No. 42 on postcard, p. 141.



HERE'S HOW benchmaster Koil Kradle IMPROVES ALL AUTOMATIC FEEDING!

BIGGER COIL CAPACITY—handles 200 to 400% more weight at one time!

FEWER SHUTDOWNS—Big coils run hours longer, eliminate production losses during reloading periods!

FASTER, EASIER LOADING—you simply roll the coil up the ramp into feeding position. No heavy lifting. Strenuous labor is eliminated!

MORE PRODUCTION—automatic power feeding *as your machine needs it*, puts more footage through per hour!

VARIABLE TIME DELAY allows operator to set unit to consistently maintain any desired length of slack loop.

KOIL KRADLE automatically supplies a slack loop from any type of coiled stock, wire or strip. Can be used with punch presses, slitters, shears, forming rolls, etc. Removes drag on feeding devices, improves locating accuracy on multiple and progressive die operations.

Write for new circular!

Benchmaster Manufacturing Co.
1835 W. Rosecrans Ave.
Gardena, California

benchmaster
World's largest manufacturer of small punch presses and mills.

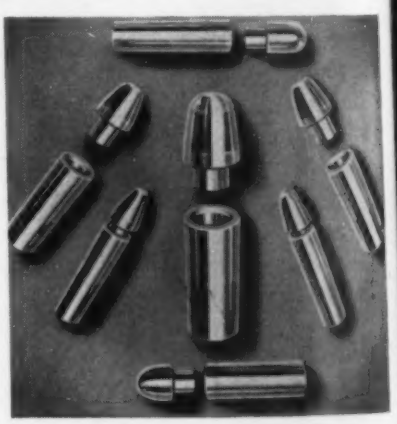
Enamel stripper

New enamel stripper to remove epoxy type enamels and most other enamels is operated at room temperature. Enamel is removed by a wrinkling action, and the stripper and loosened enamel are removed from the work by a water rinse. A water seal is used on the stripper to reduce evaporating losses. Stripper is non-flammable, mild in odor and pleasant to use. *Enthone, Inc.*

For more data circle No. 43 on postcard, p. 141.

Recap tips and shanks

Recap tips and adapter shanks made of Ampco's high quality, high conductivity alloys provide a double water seal. Welding face of the tip can easily be ejected without removing the entire electrode from



the holder. Electrode dressing cost and downtime on equipment is said to be saved in high production shops. Because of its taper length, the insert can be used in dies and in many restricted places where clearances are inadequate to permit a standard tip. *Ampco Metal, Inc.*

For more data circle No. 44 on postcard, p. 141.

Turn Page

Only The Commercial Heat Treater Can Give You Complete Service...

"Custom Tailored"

To Meet Your Specifications

A Member of MTI Is a Leader in the Field Known for Quality—Service—Technical Ability

The reasons for the growth and national acceptance of the commercial heat treating industry are numerous, but fundamentally are based upon one important factor namely "Completeness of Service" from A to Z — all under one roof.

Of equal importance is the fact that this very versatility automatically with time creates an equally wide variety of skills — skills in handling and processing all types of heat treating from simple stress relief to delicate controlled atmosphere hardening, nitriding, etc.

In the true sense of the word your commercial heat treater is a "Specialist" with his entire organization established and built around "*Service.*"

The members of the Metal Treating Institute are the recognized leaders of the field and comply with the high quality standards established by such a group.

If you are faced with heat treating problems or the need for heat treating services consult your Commercial Heat Treater.

There's a Heat Treating Specialist Near Your Plant

Ace Heat Treating Company
Elizabeth, New Jersey

Anderson Steel Treating Co.
Detroit, Michigan

Benedict-Miller, Inc.
Lyndhurst, New Jersey

Commercial Metal Treating, Inc.
Bridgeport, Conn.

Commercial Steel Treating Corp.
Detroit 4, Michigan

Cook Heat Treating Co. of Texas
Houston 11, Texas

The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio

The Drever Company
Philadelphia 33, Pennsylvania

Greenman Steel Treating Company
Worcester 5, Massachusetts

Fred Heinzelman & Sons
New York 12, New York

Alfred Heller Heat Treating Co.
New York 7, New York

Hollywood Heat Treating Co.
Los Angeles 38, California

L-R Heat Treating Company
Newark, New Jersey

The Lakeside Steel Improvement Co.
Cleveland 14, Ohio

Metal Treating, Inc.
Milwaukee 4, Wisconsin

Metallurgical Inc.
Minneapolis 7, Minnesota

Metallurgical Inc.
Kansas City 8, Missouri

Metlab Company
Philadelphia 18, Pennsylvania

Metro Heat Treating Corp.
New York 13, New York & Ridgefield, N. J.

O. T. Muehlemeyer Heat Treating Co.
Rockford, Illinois

Nerl Heat Treating Corp.
South Bend, Indiana

New England Metallurgical Corp.
South Boston 27, Massachusetts

Paulo Products Company
Saint Louis 10, Missouri

Pearson Industrial Steel Treating Co.
Chicago 50, Illinois

Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania

The Queen City Steel Treating Co.
Cincinnati 25, Ohio

J. W. Rex Company
Lansdale, Pennsylvania

Stanley P. Rockwell Company
Hartford 5, Connecticut

C. U. Scott & Son, Inc. (Stainless Steels)
Rock Island, Ill.

Syracuse Heat Treat Corporation
Syracuse, New York

Vincent Steel Process Company
Detroit, Michigan

Winton Heat Treating Company
Cleveland 16, Ohio

MASTER CRAFTSMEN
METAL TREATING INSTITUTE

This advertisement sponsored by these Companies which are members of the Metal Treating Institute.

PUNCHES
DIES · RIVET SETS
COMPRESSION
RIVETER DIES
Made of highest standards and uniform quality thus insuring maximum service. Since 1903
Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.
Write Dept. B for Catalog 46
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS

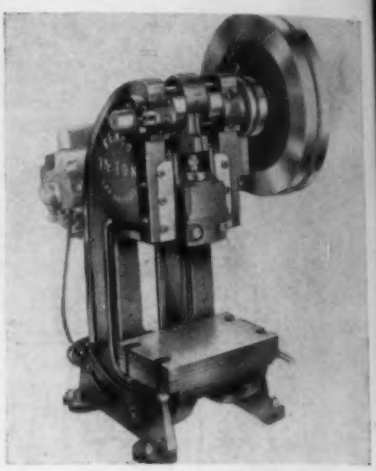
New—Carbide Tool Finishing Attachment
for DoALL Band Machines
• Unique tool holder rests on band machine table
• Holds tools at any angle
• No need to buy special machines
In stock at 38 local DoALL Service-Stores. Consult your classified phone directory. Ask for free demonstration.
Also complete stocks of abrasive finishing bands
28
Call Your DoALL Service-Store
DoALL SAW BANDS
DoALL GAGE BLOCKS
DoALL GRANITE PLATES
Machine Tools • Cutting Tools • Measuring Instruments
Shop Supplies • In Stock
The DoALL Company, Des Plaines, Ill.

—New Equipment—

Continued

Power press

A 7½-ton power press of robust structure, rigid specifications and precision built is open-backed and inclinable. All parts are interchangeable and made extra-heavy for long life and trouble-free operation. A 100-lb flywheel is mounted on two roller bearings. Special alloyed bronze, oversized bearings contain the crankshaft and the connecting rod. Ram and ram guide



are 90°, V-type, Sobrocast, oversized in length for added precision. Frame is trip-ribbed, to give strength and rigidity and is said to have safety factor of five. Single trip is standard equipment; can be converted to continuous instantly by moving one lever. Standard stroke is 1½ in.; shut height is 7¾ in. to bolster bed, adjustment up, ram down. Standard press is a bench model; floor legs are additional. *Kenco Mfg. Co.*

For more data circle No. 45 on postcard, p. 141.

Small parts cleaner

A two compartment rinse tank is available for the cleaning of small parts after they have been vapor blasted or liquid honed. The entire tank, inside and out, is hot dipped galvanized. One compartment is a hot solution tank with a thermostatic control on the shielded heating element and the other compartment is a cold solution rinse. These rinse tanks are small and compact, easy to use and on one frame. *Vapor Blast Mfg. Co.*

For more data circle No. 46 on postcard, p. 141.

Turn Page

DRILL 1/2" 4 HOLES 90° APART
Fx ALL "O" RING GROOVE SURFACES
Fx SQ WITH THD
1-14 N F THD
3/16 DRILL-6 HOLES 60° F.S° APART
Fx SEAT
STAMP PART No. 611 4416
MILL 6 FLATS 60° APART .03-.04 DEEP (FLATS REQUIRED)
52.14213-1 MAXEL 3½-3.00 O.D. x 10 3/16 LONG
PART NO. DESCRIPTION STOCK
VALVE
TESTER
611 4416

intricately machined MAX-EL alloy steel part shows minimum distortion after heat treatment...

Halliburton Oil Well Cementing Company, Duncan, Oklahoma, selected hot rolled MAX-EL 3½ bar stock for the valve shown. It's an important part of their 5⅞" tester, used to sample fluids or gases during drilling operations, sometimes 15,000 to 20,000 feet below the surface.

The valve is machined in the annealed condition and then heat-treated. Even though it varies considerably in thickness, no distortion problems are encountered in this MAX-EL part.

Try MAX-EL in your shop. You'll like its better machinability, freedom from distortion and over-all quality. And you'll get longer tool life . . . more pieces per grind. Call Crucible for immediate warehouse delivery of MAX-EL steels.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **ALLOY STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DAYTON DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

UNIVERSITY OF MICHIGAN LIBRARIES

"- - - and then one day I made my fortune by switching the shop to Columbia SUPERDIE."

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.
Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

STOP PRODUCTION ERRORS
with NEW Bausch & Lomb
OPTICAL COMPARATOR

•
Sold Exclusively by DoALL
•
Finest, Lowest Priced, Quality Unit of its Kind
•
Get the Facts
Consult classified phone directory for DoALL Service-Store that stocks gages, cutting tools, supplies.

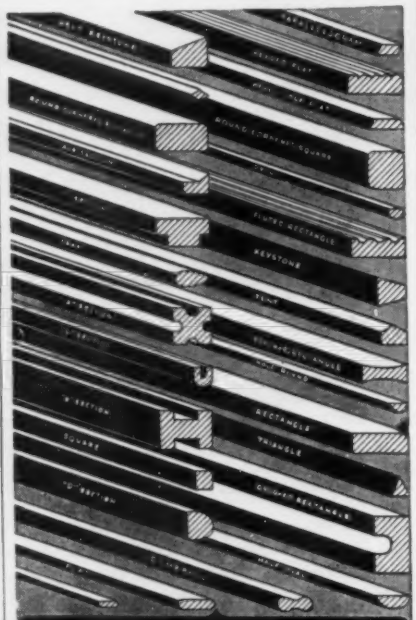
Checks to "tenths"
•
Anyone can operate it
•
Can be used without fixtures

34

Call Your DoALL Service-Store

Machine Tools • Cutting Tools • Measuring Instruments
Shop Supplies • In Stock

The DoALL Company, Des Plaines, Ill.



Shaped Wire
TO YOUR "SPECS"
High- and Low-Carbon Steel and Non-Ferrous Wire . . . shaped to your exact specifications.
CHARTER WIRE, INC.
MILWAUKEE
Phone BRoadway 6-1329
635 E. Polk Street, Milwaukee 2, Wisconsin

Motor spindle machine

The Edlund model M. S. with motor spindle is designed for general production work and tool room use. The 2 hp motor gives a drilling capacity of 1 in. with additional capacity to 1¼ in. using back gears. Models can be furnished with

semi-automatic power feed, reversing motor tapper and lead screw tapper. Direct drive spindle speeds range from 600 to 3600 rpm with additional slower speeds of 115 to 900 rpm obtainable by application of back gears. Machines can be fitted with flange quill, for multiple head mounting. *Edlund Machinery Co.*

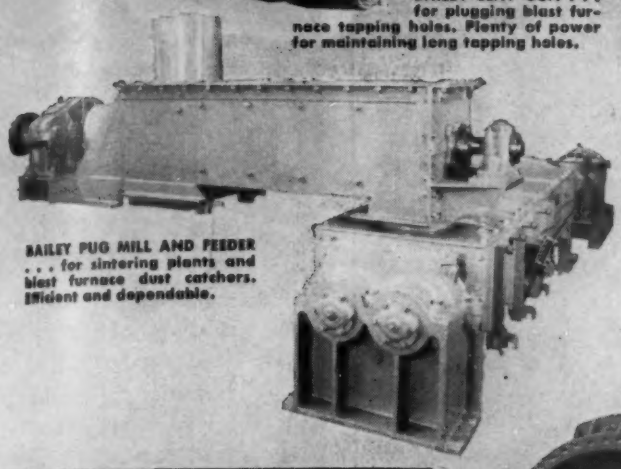
For more data circle No. 47 on postcard, p. 141.

Sorting strip, plate

For automatic sorting of continuous strip and plate production, a new classifying unit functioning with AccuRay non-contacting radiation gages, automatically sorts and classifies strip after it has been measured. The classifier provides percentage deviation tolerance limits. Thickness ranges can be changed without resetting tolerance limits, and high and low tolerance limits can be adjusted independently of each other to provide differential rejection points above and below specification. Lights on the panel front indicate when the strip is over, under, or within specification. *Industrial Nucleonics Corp.*

For more data circle No. 48 on postcard, p. 141.
Turn Page

BAILEY CLAY GUN . . . for plugging blast furnace tapping holes. Plenty of power for maintaining long tapping holes.



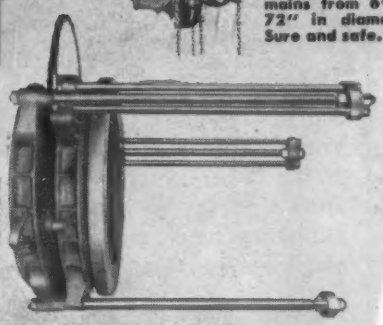
BAILEY PUG MILL AND FEEDER . . . for sintering plants and blast furnace dust catchers. Efficient and dependable.

Bailey EQUIPMENT Does many jobs

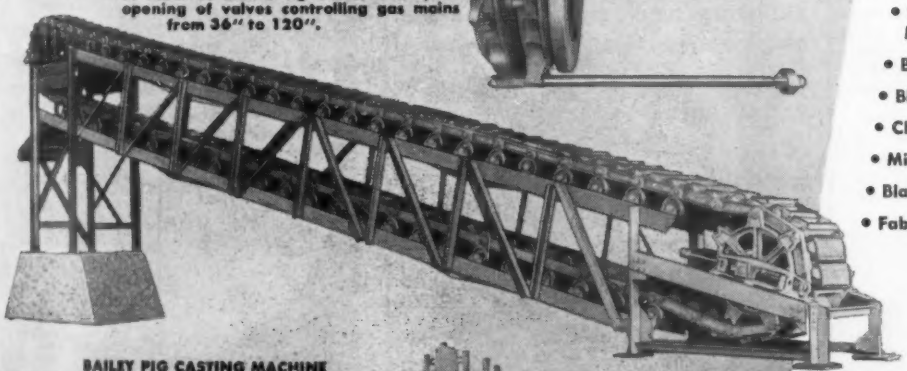
. . . EFFICIENTLY
. . . SAFELY . . . and
WITH LESS MAINTENANCE

BAILEY Mechanical GOGGLE VALVE . . . for controlling gas mains from 6" to 72" in diameter. Sure and safe.

BAILEY CINDER NOTCH STOPPER . . . eliminates hazards to workmen at the cinder notch.



BAILEY Thermal Expansion GOGGLE VALVE . . . uses linear expansion and contraction of steel to insure tight seal and quick opening of valves controlling gas mains from 36" to 120".



BAILEY PIG CASTING MACHINE . . . for increased casting capacity for foundries and blast furnaces. Sturdy, trouble-free.

Each piece of Bailey Equipment is engineered with two basic ideas in mind—safety under all operating conditions, and highly efficient operation with a minimum of maintenance.

- Thermal Expansion Goggle Valve
- Mechanical Goggle Valve
- Electric Plunger Clay Gun
- Double Shaft Pug Mill
- Sintering Plant Pug Mill
- Cinder Notch Stopper
- Stationary Wheel Pig Casting Machine
- Blast Furnace Cold Blast Valve
- Blast Furnace Blow-Off Valve
- Check and Snort Valve
- Mixing and Check Relief Valve
- Blast Furnace Stove Checker
- Fabricated Steel Stove Bottom
- Regenerative Furnace Checker
- Precision Table Feeder
- Ladle Skulling Hook

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

UNIVERSITY OF MICHIGAN LIBRARIES

SHIMS
ONLY
"SHIM HEADQUARTERS"
OFFERS YOU ALL 5 TYPES

"looks like solid metal!"

THE LAMINUM® SHIM

SIMPLY PEELS FOR ADJUSTMENT

Made up of from 3 to 63 layers of .002 or .003 inch brass or steel, metallically bonded together over their entire surfaces. No dirt between layers. Peels with penknife.

"just spot-soldered on the edges"

THE LAMISOL® SHIM

FOR QUICK, ASSEMBLY LINE USE

The laminations of the LAMISOL® Shim (in brass only) are temporarily joined by spot-soldering on the edges. Gauges and number of laminations within one shim are unlimited.

"the little tab holds 'em together"

THE LAMITAB® SHIM

FOR SUPER SPEED, THIN GAUGE SITUATIONS

The little tab holds shim laminations together firmly, yet is easily removed. Different metals can be used in the same shim.

"all separate, any gauges you want"

THE LOOSE LEAF SHIM

FOR UNLIMITED FLEXIBILITY

This is the simplest of all custom-stamped shims. It is completely flexible. Usually sets including several different gauges are made up.

"swell for hand cutting simple shims"

PACKAGED SHIM STOCK

READY FOR EASY USE, WITHOUT WASTE

Thin gauge 6" x 100" rolls feed through package slots. Heavier gauges in flat envelopes. Available from your Industrial Distributor.

*T.M. Applied For

SEND FOR LITERATURE

LAMINATED SHIM COMPANY, INC.

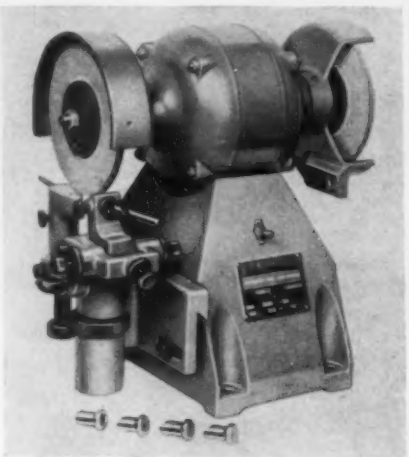
3205 UNION STREET, GLENBROOK, CONN.

—New Equipment—

Continued

Drill sharpener

New crankshaft drill point grinder provides a fast, accurate method of grinding crankshaft points on drills ranging in size from No. 1 through No. 50, A through U, and 3/64 through 3/8 in. In operation, the drill is rocked into the wheel to

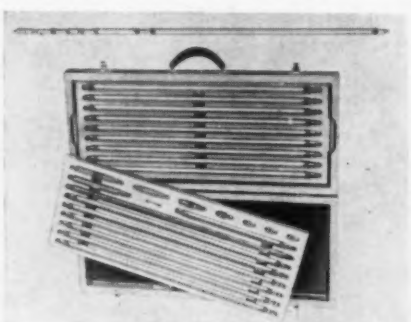


grind one notch, returned, indexed 180°, and the operation repeated for the other notch. An adjustable diamond truing device trues the wheel with one quick motion. Tilting fixture is adjustable for any sharpening angle. *Union Twist Drill Co.*

For more data circle No. 49 on postcard, p. 141.

Inside micrometers

An inside micrometer capable of high accuracies to lengths up to 30 ft is being offered on special order. The instrument has a minimum reading of 6 ft and a maximum of 30 ft, and will mea-



sure any dimension between. A special micrometer head and 25 extensions, used in combination, permit this broad coverage. Each extension is calibrated to the nearest ten-thousandth. *Brown & Sharpe Mfg. Co.*

For more data circle No. 50 on postcard, p. 141.

Hyde Park
RED CIRCLE Rolls ALLOY-CHILLED

Gray Iron Castings

Castings of any size up to 80,000 pounds. Hyde Park facilities are equal to your every requirement

Machine Castings
Lathe Beds
Housings
Pinion Housings
Mill Housings
Shoe Plates
Layout Plates
Surface Plates

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

New Equipment

Continued

Welding positioner

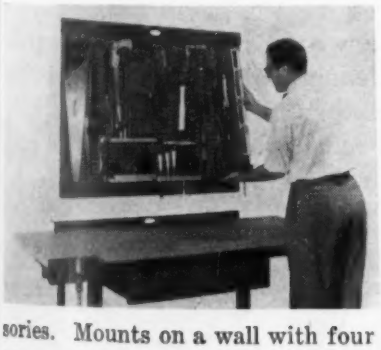
A bench model welding positioner available with hand or power table tilt offers a method of positioning work for efficient and economical downhand welding. It is designed for smooth, dependable, full-range movement of work, with reversible, variable speed adjustment under

full control of the welder. It is fabricated to machine tool standards of precision and built for long life of dependable, trouble-free service. An infinite range of speeds is provided through a simple control with extra low creeping speed for certain welding operations. *American Equipment Co.*

For more data circle No. 51 on postcard, p. 141.

Steel tool rack

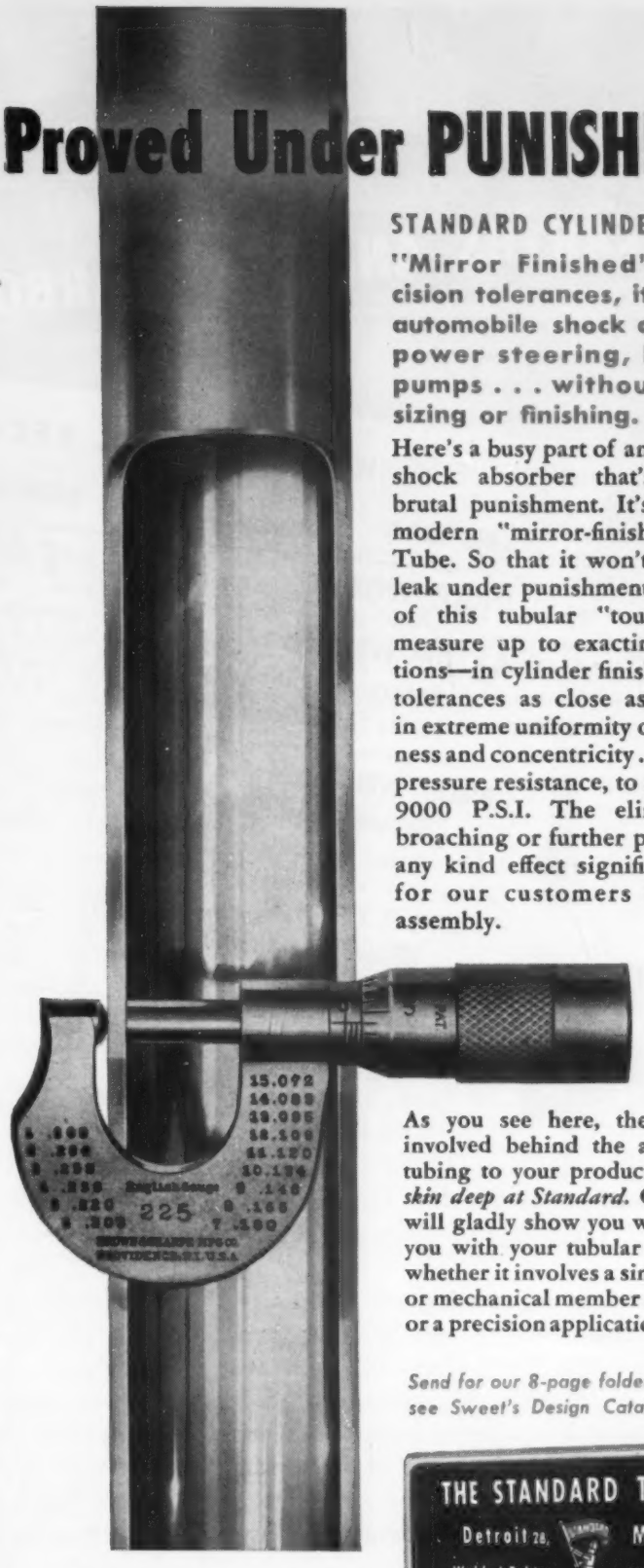
All-steel, multi-use utility rack features removable, interchangeable panels for quick arrangement or rearrangement of tools and acces-



sories. Mounts on a wall with four screws and consists of 2, 3 or 4 panels that slip into a 37-in. high frame. *Sturdi-Bilt Steel Products, Inc.*

For more data circle No. 52 on postcard, p. 141.

Proved Under PUNISHMENT



STANDARD CYLINDER TUBING

"Mirror Finished" to precision tolerances, it's used in automobile shock absorbers, power steering, hydraulic pumps . . . without further sizing or finishing.

Here's a busy part of an automobile shock absorber that's built for brutal punishment. It's Standard's modern "mirror-finish" Cylinder Tube. So that it won't weaken or leak under punishment, every inch of this tubular "toughie" must measure up to exacting specifications—in cylinder finish . . . in I.D. tolerances as close as .001" . . . in extreme uniformity of wall thickness and concentricity . . . in internal pressure resistance, to shocks up to 9000 P.S.I. The elimination of broaching or further processing of any kind effect significant savings for our customers in product assembly.

As you see here, the engineering involved behind the application of tubing to your product is *more than skin deep at Standard.* Our engineers will gladly show you why in helping you with your tubular application—whether it involves a simple structural or mechanical member . . . or a precision application.

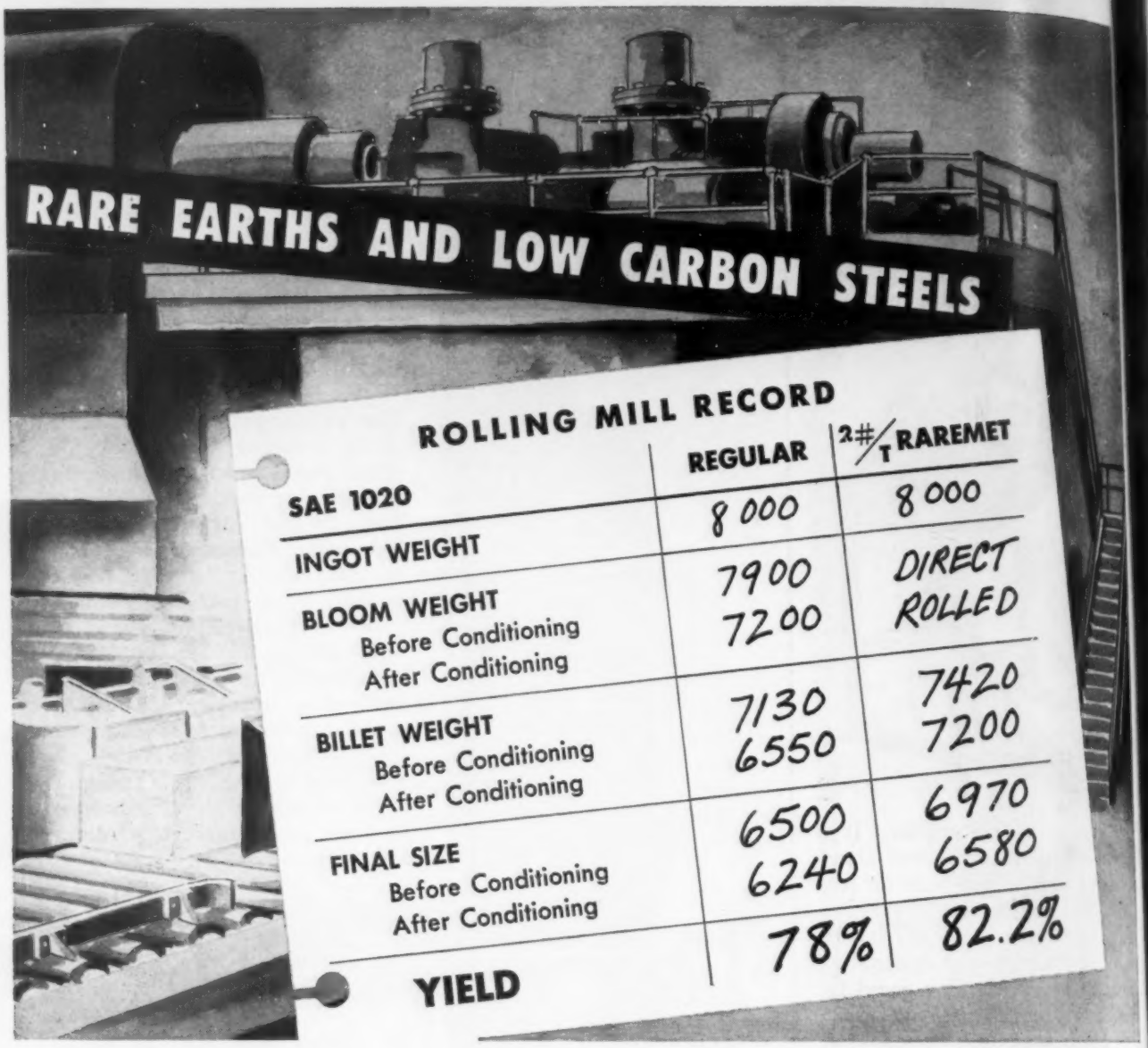
Send for our 8-page folder or see Sweet's Design Catalog.

MAKE "STANDARD" YOUR SOURCE FOR—

- WELDED MECHANICAL TUBING
- WELDED STAINLESS TUBING
- BOILER AND HEAT EXCHANGER TUBING
- EXCLUSIVE "RIGIDIZED" PATTERNS

STEEL TUBING SIZES: ½" O.D. TO 5½" O.D.—.028 TO .260 WALL. STAINLESS SIZES: ¼" O.D. TO 4½" O.D.—.020 TO .154 WALL.

UNIVERSITY OF MICHIGAN LIBRARIES



The troubles of producing low carbon steels have been mainly confined to rolling and surface preparation.

Since production economies are necessary, it's important to know what marked improvements have recently been obtained by Rare Earths in steel production. Minimizing blooming mill cracking, less conditioning time per ton, and increased yields are some of the results already proven. More than 200 production heats of low carbon steel show production savings which alert steel operators can use to advantage.

This recent progress further justifies economical rare earth additions for iron and steel. Commercially known as RareMeT Compound, it is conveniently packaged in ten pound containers.

Operating the world's largest rare earth deposits, Molybdenum Corporation of America welcomes requests for additional technical application data for specific problems. Complete and immediate response to inquiries is offered.

MOLYBDENUM

CORPORATION OF AMERICA

Grant Building **Pittsburgh 19, Pa.**

Offices: Pittsburgh, Chicago, Detroit, Los Angeles, New York, San Francisco
Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco
Subsidiary: Cleveland Tungsten, Inc., Cleveland *Plants:* Washington, Pa., York, Pa.

MCA

The Iron Age
FOUNDED 1855
Markets and Prices

THE IRON AGE SUMMARY...

- Time running out on predicted market upturn
- Serious labor bargaining will spark buying
- Scrap prices continue to gain in mild market

Time is running out on the predicted improvement in the steel market. If there is to be an increase in steelmaking operations now is the time for it to start showing on the order books.

Chances are they will. The steel wage contract expires June 30; all-important bargaining starts next Tuesday (May 18). As the seriousness of the bargaining becomes apparent many steel users will decide they should have a little more steel on hand—just in case. Depending on how the bargaining goes, this could bring about a reversal in the inventory trend.

Increased buying should begin to show on steel company order books within the next 3 or 4 weeks. If it doesn't show by then, there may be no significant pickup in steel until fall. Signing of a wage agreement would certainly remove any protective buying from the market.

Real progress is being made in the long and painful steel inventory adjustment. Rate of new orders has been increasing. Some mills now find new business supporting current operations for the first time in months.

For the past several months producers have maintained production largely at the expense of order backlogs. Now reports from district sales offices indicate the inventory problem should rapidly become less of a factor.

Producers are also encouraged by renewed buying from some customers who had been virtually out of the market. Orders are for the most part very small, indicating consumers are buying cautiously.

Both steel producers and consumers are encouraged by the mild wording of the four-point program adopted by the steelworkers' Wage Policy Committee. This is generally cited as an indication that there will be no strike this year.

But this mild wording could turn out to be the velvet glove that conceals the iron fist. It certainly doesn't conceal the fact that steel and union officials will begin bargaining poles apart.

The road to agreement will be long and hard. Final compromise package will likely add from 5¢ to 8¢ an hour to industry employment costs. The package will include improvements in pensions and insurance, and perhaps wages; but the much publicized guaranteed annual wage is already a dead duck. It will probably be relegated to further study.

Changes in base and extra prices of stainless steel by a leading producer last week are expected to set an industry pattern of pricing based on modern production methods. Changes reflect economies through use of continuous mills, as well as high cost of producing certain grades on hand mills. Result: Consumers will find it advantageous to order strip and sheet in coils instead of cut lengths.

Steel scrap prices again registered scattered increases in the absence of any real upturn in mill buying. Increases this week raised THE IRON AGE Steel Scrap Composite Price 33¢ a ton to $27.58 per gross ton.

Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Net Tons Produced (000 omitted)	1,636	1,654	1,622	2,262
Ingot Production Index (1947—49=100)	101.8	103.0	101.0	140.8
District Operating Rates				
Chicago	80.0	79.0*	76.0	105.0
Pittsburgh	69.0	68.0	73.0	96.0
Philadelphia	59.0	59.0	60.0	98.0
Valley	67.0	66.0*	61.0	102.0
West	75.0	71.5*	76.5	107.0
Detroit	78.0	75.0	72.0	109.0
Buffalo	67.5	67.5	67.5	106.5
Cleveland	74.0	71.5*	64.0	98.0
Birmingham	56.5	56.5	46.0	101.0
S. Ohio River	80.5	80.0	75.0	84.5
Wheeling	90.0	92.0	81.0	103.0
St. Louis	72.5	72.5	62.5	92.0
East	31.0	52.0*	54.0	101.0
Aggregate	68.5	68.5*	68.0	100.5

Per cent of capacity for weeks in 1954 is based on annual capacity of 124,330,410 net tons as of Jan. 1, 1954. Per cent of capacity for last year is based on annual capacity of 117,547,470 tons as of Jan. 1, 1953.

* Revised.

† Tentative.

STEEL OUTLOOK — STEEL OUTLOOK — STEEL OUTLOOK
UNIVERSITY OF MICHIGAN LIBRARIES

A Spanish milled dollar—widely circulated in the U. S. in the 1780's. Write to The Bank for a copy of the folder, *TIMOTHY PICKERING, COLONIAL COIN-CLIPPER*, relating a little known incident in the early history of American money.

Yesterday and Today...

A Bank for Business

Seasoned in years and experience, and alert to the banking needs of modern business . . . this description summarizes our position in the national financial scene. Today, we transact business in each of the 48 states and finance foreign trade throughout the world, serving industry and individuals in a wide variety of capacities.

Our Commercial Department, as well as our Trust and Investment Counsel Departments, is ready to meet your needs with promptness, skill and dependability. Whatever your financial problem, we suggest that you investigate the up-to-date services of New York's oldest bank, founded in 1784 by business men for business men.

THE BANK OF NEW YORK

New York's First Bank • Founded 1784

Main Office: 48 WALL ST. ☆ Uptown Offices: 530 FIFTH AVE. ☆ MADISON AVE. AT 63rd ☆ MADISON AVE. AT 73rd

Member Federal Deposit Insurance Corporation

Markets at a Glance

Builds Body Plant . . . General Motors plans to build a new Fisher Body fabricating plant on the site of GM's former Detroit Transmission plant at Livonia, Mich., which was gutted by fire last August. Construction of the plant is part of GM's billion dollar expansion program announced in January. New plant will add approximately 628,000 sq ft to the buildings left after the fire. Total plant area by the time construction is completed early next year will be 920,000 sq ft.

Demand Air Conditioners . . . Sales of auto air conditioning units are pointing the way to potential big time markets. High price, $600 plus, has been chief cause of sale resistance even in South and Southwest. However, the recently introduced Nash All-Weather Eye, a $395 heating or cooling package, has found excellent acceptance throughout the nation. Next important development in auto air conditioning is expected to be a unit based on heat pump theory. This cooling device would reduce complicated mechanism and meet a $250 price which should increase the market considerably.

Increase Production . . . Granite City Steel Co. has recalled 260 laid-off employees and put 400 employees who have been working 4 days a week back on a 5-day week. Increase in employment was made possible by recent improvements in the company's business. Granite City also has returned a fourth and fifth openhearth furnace to production.

Pittsburgh Market Dull . . . Steel producers in Pittsburgh report a quiet market with demand leveled off—no longer falling, but showing no signs of upturn as yet. One sales manager felt that any upturn in the general economy would be reflected quickly in demand for steel now that inventories are down. In fact demand could very well pyramid the other way just as it fell off when inventory cutbacks began.

Ease Up on Aluminum . . . A further easing in military and atomic energy demands for aluminum will make it possible to trim third quarter allocations of aluminum for defense and atomic orders to 134 million lb. This figure is 15 pct of the anticipated supply of domestic and imported primary aluminum for the third quarter. In the second quarter, military and atomic orders will have 19 pct of available supply set aside for these uses.

Cut Stainless Prices . . . U. S. Steel Corp. has revised prices of both sheet and strip stainless steel. Base price reductions in sheet range from $30 to $180 per ton. Some grades of hot-rolled strip were reduced from $25 to $225 per ton. Five grades of hot-rolled strip were cut $20 to $95 per ton. See page 73.

Make More Loans . . . Small Business Administration, which has been awarding 63 pct of its loans to manufacturing companies, has granted 225 loans totaling $13.1 million since last Oct. 1.

More Alloy Orders . . . Alloy order books for the second quarter are better than for the first. However, there are indications that orders will fall off later due to automotive changeovers.

Canadian Traffic Drops . . . Reduced traffic on Canadian railways is reflected in lower earnings by Canadian National Railways for March 1954, and for the first 3 months of the year as compared with like period in 1953. Gross operating revenues in March amounted to $55,862,000, a decrease of $4,527,000.

Revise Bar Extras . . . La Salle Steel Co., Chicago, has issued a new list of extras applying to cold-finished alloy bars. Extra charges were reduced 10¢ per 100 lb on all steels containing 0.15 to 0.25 pct molybdenum and extras for near-squares were added.

Shutdown . . . U. S. Steel Corp. has taken blast furnace No. 2 at Edgar Thomson Works, Pittsburgh, out of production as of May 7.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy (gross ton)	$27.58	$27.25	$25.17	$38.67
Nonferrous				
Aluminum, ingot	21.50	21.50	21.50	20.50
Copper, electrolytic	30.00	30.00	30.00	29.875
Lead, St. Louis	13.80	13.80	13.80	12.30
Magnesium, ingot	27.75	27.75	27.75	27.00
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	93.50	93.50	99.50	96.50
Zinc, E. St. Louis	10.25	10.25	10.25	11.00

UNIVERSITY OF MICHIGAN LIBRARIES

Aluminum Shipments Up in March

All categories higher except three . . . Foil sets third straight record . . . Kennecott goes back to 6-day week in West . . . Zinc shows little change for April—By R. L. Hatschek.

Past week in the metals markets has been quiet—but with more underlying strength and optimism than many observers thought. Aluminum shipments are definitely bouncing and copper prices continue steady, defying predictions made early in the year.

Zinc picture remains virtually unchanged from March when growth of smelter stocks was just about stopped. Manufacturers report heavier shipments of automotive replacement batteries to bolster lead feelings. And ever-sensitive to the East, tin trading jumped at Dienbienphu's fall.

Aluminum . . . Definite signs of the upturn in aluminum business are found in the March tonnages of mill products shipped. In a number of cases these totals are nearly as high as last October and November—in other cases the March figures are higher.

Sheet and plate snapped back from low points and foil scored the third consecutive monthly record with 5919 tons shipped. Wire, rod and bar, along with forgings, are reasonably steady. Aluminum cable, steel reinforced is fairly singing along. Sand castings continue to slip while die and permanent mold castings recorded the highest monthly figures since Aluminum Assn. started reporting shipments.

ALUMINUM SHIPMENTS

(Net Tons)

	Mar.	Feb.
Sheet & Plate, total	41,242	34,122*
Non Heat-Treatable	31,240	25,681*
Heat-Treatable	10,003	8,440*
Foil	5,919	5,546
Extruded Products, total	10,851	8,793
Soft Alloys	7,749	6,529
Hard Alloys	3,102	2,265
Tube, Drawn, total	3,458	2,585
Soft Alloys	3,050	2,190
Hard Alloys	408	395
Rod & Bar, Rolled	5,419	5,908
ACSR & Cable, Bare	5,097	4,323
Wire, Other than Conductor	1,423	1,401*
Forgings	2,129	2,151
Castings, total	12,964	12,256
Sand	1,0.2	1,048
Permanent Mold	5,945	5,582
Die	5,987	5,626

* Revised.

Dealers and exporters of aluminum scrap have come quickly to the fore to deny claims of smelters that supply is short. Smelters have requested a government restriction on aluminum scrap (THE IRON AGE, May 6, p. 202). The dealers and exporters told Business & Defense Services Administration that they've had to seek overseas markets because of reduced orders from domestic consumers.

They said further that foreign demand is slackening and is expected to continue downward.

Copper . . . Simultaneous with the report that Kennecott Copper Corp. earnings in the first quarter were lower than they were a year ago came news that the firm would boost its western production by returning to a 6-day week starting next week. This will boost refined copper output by about 5000 tons monthly.

Kennecott's production for first quarter totaled about 120,000 tons as compared to 143,000 tons in the same period last year. This includes both domestic and Chilean copper. April sales, the firm reports, exceeded production and stocks were consequently reduced. Outlook for second quarter is better.

It was indicated last week that details of the U.S.-Chilean deal for 100,000 tons of copper would be released shortly. According to the report, all details have been settled except for the exchange of funds.

Market continues steady with good tonnages being sold for May delivery.

Zinc . . . April statistics of the American Zinc Institute show practically no appreciable change from the previous month—which comes as no great surprise. But at least a moral victory was won as smelter stocks of slab declined for the first time in 11 months. Decline, however, was minute—less than 300 tons.

Production for the month was 70,233 tons as compared to 71,186 tons in March. Shipments totaled 70,525 tons against 70,080 tons for March, and stocks at the end of April stood at 200,808 tons compared to 201,100 tons the month before. Unfilled orders dipped about 5500 tons to 31,702 tons at the beginning of this month. Export picture grew dimmer with a total of 977 tons against 1703 tons in March.

Lead . . . Market for lead continued throughout the week at an even pace with moderate tonnages changing hands. One bright note was the report from the Assn. of American Battery Manufacturers that first quarter shipments of replacement batteries topped last year's by about 12 pct.

Tin . . . Fall of Dienbienphu sparked some active trading in tin last Friday with prices regaining some of the ground they'd lost in recent weeks.

Meanwhile, the Senate committee hearing on continuing operation of the Texas City smelter has been postponed pending definite knowledge as to whether or not the Administration bill to close it will be submitted to Congress.

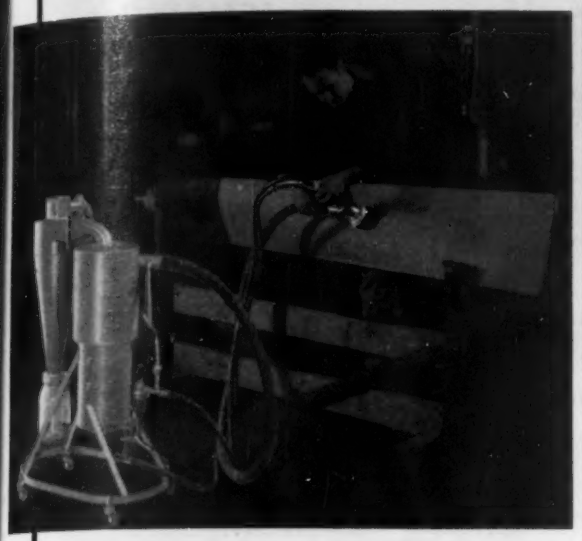
NONFERROUS METAL PRICES

(Cents per lb except as noted)

	May 5	May 6	May 7	May 8	May 10	May 11
Copper, electro, Conn.	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake, delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	93.50	92.50	93.50	....	93.50	93.50*
Zinc, East St. Louis	10.25	10.25	10.25	10.25	10.25	10.25
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices
*Tentative

THIS IS IT---



For faster, better metal cleaning in welding and paint shops, for spot cleaning, touch-up work and a hundred other plant maintenance applications—wherever *dust-free* cleaning is required . . .

NOTHING EQUALS THE V-B JUNIOR

America's newest, simplest low-cost *blast cleaner*—

COMPARE these outstanding advantages with your present cleaning methods, then judge for yourself:

- **COMPLETELY DUST-FREE**—Patented Vacu-Blast pickup enables the V-B JUNIOR to operate **anywhere** . . . without interrupting other work.
- **REALLY CLEANS**—V-B JUNIOR gives metal the clean, scale-free surface needed for perfect welds . . . does it faster and better than grinding or wire brushing.
- **LIGHT WEIGHT, PORTABLE**—caster-mounted for easy mobility—weighs only 80 pounds—occupies less than 5 sq. ft. of floor space—uses many types of abrasive.
- **ECONOMICAL**—Low first cost, low operating cost and negligible maintenance cost spell economy—any way you look at it.

IT PAYS TO GET THE FACTS ABOUT V-B JUNIOR

Write today for the full story on this sensational new blast cleaner.

VACU-BLAST CO. INC.

P. O. BOX 885-H BELMONT, CALIFORNIA

Porous Castings?

I still say,

"HANG THE COST, SCRAP 'EM!"

That's *one* way to make sure you'll never sell or use porous castings*—if you don't mind the expense and waste.

But for hundreds of progressive companies, modern IMPREX Impregnation-Sealing has obsoleted this high-cost "scrap-and-throw-'em-back-in-the-cupola" system.

And, by impregnating, these companies have reduced scrap castings to the lowest point in their history. They are saving money hand-over-fist—and the quality of their castings has never been so good!

IMPREX Impregnation-Sealing has proven itself on some of industry's toughest assignments. New IMPREX Metallic Sealants achieve a deep-in penetration that insures positive and *permanent* sealing. And for very coarse porosity, still newer IMPREX Plastic Sealants have been developed that stop even "squirters"—once and for all.

These are facts we'd like to prove to you. Just send us a sample batch of castings you've found to be porous. We'll pay the shipping costs both ways—impregnate them and return them. YOU TEST THEM ANY WAY YOU LIKE. No cost or obligation—send the coupon for shipping instructions today.

TINCHER IMPREX PROCESS

SEALS FOR HIGHER QUALITY, MORE PROFITABLE PRODUCTION

**Castings that must withstand liquid or air pressures and which have been rejected after tests as "leakers."*

TINCHER PRODUCTS COMPANY, 820 Borden Ave., Sycamore, Ill.

Please send shipping instructions for my sample batch of castings consisting of_____pieces. They weigh about_____ each and are_____(give approx. dimensions) in size.

Name_____

Title_____

Company_____

Street_____

City_____ Zone____ State_____

UNIVERSITY OF MICHIGAN LIBRARIES

Nonferrous Prices

(Effective May 11, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢; 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.5¢ to 82.8¢; 12 to 14, 37.2¢ to 99.0¢; 24 to 26, 39.9¢ to $1.29; 36 to 38, 47.2¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.449-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 69.6¢ to 47.0¢; ⅝ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 57¢; ⅛ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $11; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
seamless tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41	....	48.48
Copper, h-r	48.38	44.73	....
Copper, drawn	....	45.98	....
Low brass	44.47	44.41	....
Yellow brass	41.72	41.66	....
Red brass	45.44	45.38	....
Naval brass	45.76	40.07	41.33
Leaded brass	....	....	39.11
Com. bronze	46.95	46.89	....
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	....
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36	....	62.63

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
ingot	27.75
Magnesium, sticks, 100 to 500 lb,	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$238 to $240
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$21.00
Platinum, dollars per troy oz.	$84 to $87
Silver, New York, cents per oz.	85.25
Tin, New York	93.25
Titanium, sponge, grade A-1	$4.72
Zinc, East St. Louis	10.25
Zinc, New York	10.75
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	26.00
No. 120	25.25
No. 123	24.75
80-10-10 ingot	
No. 305	31.00
No. 315	28.75
88-10-2 ingot	
No. 210	40.75
No. 215	37.25
No. 245	32.25
Yellow ingot	
No. 405	22.25
Manganese bronze	
No. 421	26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	23.25-24.00
0.60 copper, max.	23.00-23.75
Piston alloys (No. 122 type)	21.00-23.00
No. 12 alum. (No. 2 grade)	20.50-21.00
108 alloy	20.50-21.50
195 alloy	22.00-22.75
13 alloy (0.60 copper max.)	23.00-23.75
ASX-679	20.50-21.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	21.50-22.50
Grade 2—92-95%	20.50-21.50
Grade 3—90-92%	19.00-19.50
Grade 4—85-90%	18.00-18.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.54
Electrodeposited	38.38
Flat rolled	47.14
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	81.75
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¾
Yellow brass	19¾	18
Red brass	23	22¼
Comm. bronze	23⅞	23½
Mang. bronze	18¼	17½
Yellow brass rod ends	19½	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾—27
No. 2 copper wire	25¼—25½
Light copper	23¾—24
*Refinery brass	22½

*Dry copper content.

Ingot Makers' Scrap

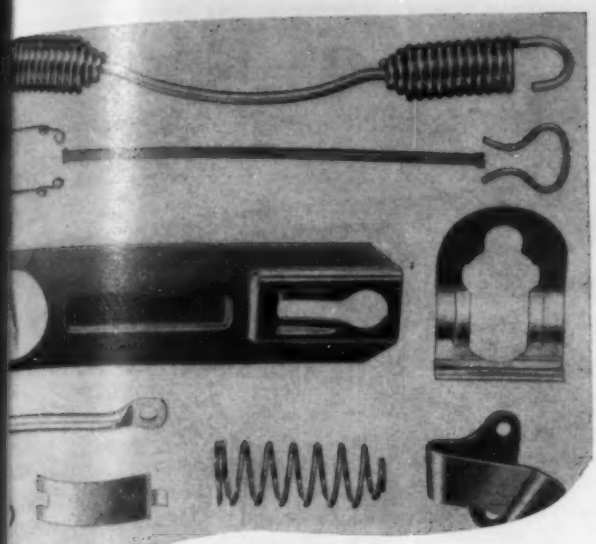
(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾—27
No. 2 copper wire	25¼—25½
Light copper	23¾—24
No. 1 composition	21½
No. 1 comp. turnings	20½
Rolled brass	17
Brass pipe	18½
Radiators	17
Aluminum	
Mixed old cast	12½—13
Mixed new clips	13 —14
Mixed turnings, dry	13 —13½
Pots and pans	12½—13

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	24½
No. 2 heavy copper and wire	23¾—24
Light copper	20¾—21
New type shell cuttings	20½
Auto radiators (unsweated)	14½—15
No. 1 composition	18½—19
No. 1 composition turnings	18 —18½
Unlined red car boxes	16
Cocks and faucets	16 —16½
Mixed heavy yellow brass	13
Old rolled brass	15½
Brass pipe	16½—17
New soft brass clippings	17½—18
Brass rod ends	15 —16
No. 1 brass rod turnings	14 —15
Aluminum	
Alum. pistons and struts	7 — 8
Aluminum crankcases	10½—11
2S aluminum clippings	13 —13½
Old sheet and utensils	10½—11
Borings and turnings	6 — 7
Misc. cast aluminum	10½—11
Dural clips (24S)	11 —11½
Zinc	
New zinc clippings	5½— 6
Old zinc	4¼— 4½
Zinc routings	2½— 2¾
Old die cast scrap	3½— 3¾
Nickel and Monel	
Pure nickel clippings	60 —65
Clean nickel turnings	40
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	22 —24
Clean Monel turnings	14 —15
Old sheet Monel	20 —22
Nickel silver clippings, mixed	13
Nickel silver turnings, mixed	11
Lead	
Soft scrap lead	11 —11¼
Battery plates (dry)	5¾— 6
Batteries, acid free	4¼
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	75 —80
No. 1 pewter	55 —60
No. 1 auto babbitt	45 —48
Mixed common babbitt	12½—13
Solder joints	16½
Siphon tops	45
Small foundry type	15¼—15½
Monotype	13¾—14
Lino. and stereotype	13 —13½
Electrotype	11¼—11½
Hand picked type shells	8 — 8½
Lino. and stereo. dross	5¼— 5½
Electro dross	3½— 4



COIL SPRING SAYS:

The easiest way—and the best way—to satisfy your needs for springs, small wire forms or small metal parts is to submit your specifications to U. S. For accurate production to exacting tolerances . . . with economies from the most modern facilities . . . in long or short runs . . . we have the cost-cutting answer to your spring problems. Just call, or send a card or letter, *today!*

No order too large or too small!

The U. S. STEEL WIRE SPRING Co.

7800 FINNEY AVE. • MICHIGAN 1-6315

CLEVELAND 5, OHIO

JOBS WANTED

I'm a high pressure triplex pump built for the toughest hydraulic power application you have. Pick the worst, give it to me, and you can forget you ever had a problem. Top references furnished.

Dear Sirs:

I'm a high pressure triplex pump built originally to work in the oil fields. Have served there 20 years in more than 1,000 jobs. Normally run 24 hours a day and frequently go a week or more without ever being looked at.

Have found this ruggedness pays off BIG in metal extruding, rubber molding, metal forming, and in various process applications.

My specialty is high pressure power (1,000 to 20,000 psi) and will deliver it with virtually no maintenance cost or down-time. If you need a hydraulic power source you can install and forget, why not check my references?

KOBE
HIGH PRESSURE
TRIPLEX PUMP

Send for Complete Data KX-1

Gentlemen:
Please send me complete information on KOBE Triplex Pumps.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

KOBE INC. DIVISION OF DRESSER EQUIPMENT CO.
3040 E. SLAUSON AVE., HUNTINGTON PARK, CALIF.

UNIVERSITY OF MICHIGAN LIBRARIES

Price Pulse Slower But Still Steady

Market continues to rise, but more slowly . . . Some areas feel plateau has been reached . . . Composite rises for 8th straight week . . . Climbs 33c to $27.58 . . . Cast scrap perks up.

The scrap market continued to rise for the eighth consecutive week, but at a more gentle rate than before. Traders in some areas, notably Chicago, Cleveland and Cincinnati, believed a plateau has been reached, that the immediate future will see a stabilizing at present levels rather than further sharp increases.

Steelmaking grades continued to rise in both Pittsburgh and Detroit, where new buying by long-quiet electric furnace shops was a notable feature. THE IRON AGE No. 1 Steel Scrap Composite rose 33¢ to $27.58.

Pittsburgh—The market advanced again this week on basis of scattered buying and recognition of strength in the Valley. No. 1 heavy melting rose $1 per ton to $31, top, and secondary grades moved up $2. Low phos and No. 1 railroad also advanced. Blast furnace scrap continues strong but prices are unchanged. Cast market is firm and brokers are having trouble filling orders. Due to limited activity and the difficulty of establishing a representative price, the item, "cut structurals, 3 ft. and under" is being dropped from the Pittsburgh price list.

Chicago—The reaction from the recent low price point has just about ended with the market momentarily stabilized at present levels. Chicago mills are operating at a good rate (one at near capacity) and the market appears to be reasonably strong and steady. Major consumers purchased at quoted prices leaving prices unchanged for the second consecutive week.

Philadelphia—With the exception of electric furnace material, scrap prices in this district remain unchanged this week. One local mill purchased low phos plate, pushing up the price $2. Openhearth mills are continuing to take some scrap in the $22 to $23.50 range. Competitive bidding has been noted on the bigger industrial lists, while dealer material remains quiet. But dealers still feel bullish.

New York—The market was quiet here this week, although several brokers and dealers continued to try and work out details on export business. Higher prices reported earlier still prevail, but no further rise seems indicated at present. Cast continues to move briskly, but pipe foundries have announced they will try to hold the price line for some time to come.

Detroit—Area consumers supported recent price increases but didn't step in with the tonnage that is required to create a really strong market. Mill inventories remain high and purchases are not heavy, although the more realistic price level is encouraging to the trade. Purchases by electric mills sent most steelmaking grades up another $1.

Cleveland — Feeling here is that steam has gone out of the market. Choice industrial and railroad scrap has been sold above current quotations but tonnages are small and a lot of scrap is being used to cover old orders. A few brokers expect to see limited increases in openhearth prices next month but most of the trade disagrees. Consumers are still showing lively interest in turnings and cast.

Birmingham—Signs of strength in the cast scrap market reported last week were confirmed this week when foundries increased prices $2 on No. 1 cast, stove plate and unstripped motor blocks. One broker, however, reported a $5 drop in charging box cast. Another sold sizeable amounts of light breakable cast at $39. An Atlanta mill bought No. 2 heavy melting steel scrap at $23 delivered, approximately $2 more than its last purchase. The largest buyer in the district, however, has not yet increased prices. Dealers are still resisting present prices and there was no movement of other grades.

St. Louis—Demand for cast iron grades is steadily increasing following a long period of inactivity. Substantial sales were made of cupola cast and cast iron brake shoes at $3 and $2 higher respectively. Demand from Birmingham and farm implement manufacturers in Iowa has added to the strength of the market. Stove plate is also up $3 a ton. Buying of openhearth grades awaits mill support of the higher market in Chicago.

Cincinnati—Local consumers who paid price premiums for industrial scrap this month are not showing too much interest in dealer material. Market is generally quiet. Brokers say May buying prices are high enough to cover existing orders with ease.

Buffalo—Dealers here continue to pin hopes for a firmer market on strength in other areas. Local mills refuse to enter the market. In addition, a bid from an outside buyer has been withdrawn. Only buying interest centers in a strong east market. Prices remained unchanged.

Boston—Small quantities of No. 2 material are moving out of this district to the Pittsburgh area but otherwise the market is very quiet.

West Coast — San Francisco cast market showed sudden strength with higher prices resulting. Major buyers stayed in $39 to $42.50 range, although some small, isolated tonnages moved at a higher figure. Dealers were swallowing $11.50 freight bills to move material in from southern Oregon.

Hamilton, Ont. — Canadian scrap prices are holding unchanged from the April level, but there are indications of minor betterment in mill demand. Mills in the Hamilton district which have been out of the market for several weeks again are taking delivery. Outlook points to May as being the best month for Canadian dealers so far this year. Cast scrap also is in restricted demand but supplies in the hands of dealers remain small.

A SYMBOL OF LEADERSHIP IN IRON & STEEL SCRAP SINCE 1889

Luria Brothers and Company, Inc.

MAIN OFFICE

LINCOLN-LIBERTY BLDG.

Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA.
READING, PENNA.
MODENA, PENNA.
DETROIT (ECORSE), MICHIGAN
PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILLINOIS
CLEVELAND, OHIO
DETROIT, MICHIGAN
HOUSTON, TEXAS
LEBANON, PENNA.
LOS ANGELES, CAL.
NEW YORK, N. Y.
SEATTLE, WASH.
PITTSBURGH, PENNA.
PUEBLO, COLORADO
READING, PENNA.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.

EXPORTS-IMPORTS — LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

UNIVERSITY OF MICHIGAN LIBRARIES

Scrap Prices

(Effective May 11, 1954)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.00 to	$31.00
No. 2 hvy. melting	28.00 to	29.00
No. 1 bundles	30.00 to	31.00
No. 2 bundles	26.00 to	27.00
Machine shop turn.	14.00 to	15.00
Mixed. bor. and ms. turns.	14.00 to	15.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	18.00 to	19.00
Low phos. punch'gs, plate	33.00 to	34.00
Heavy turnings	28.00 to	29.00
No. 1 RR. hvy. melting	32.00 to	33.00
Scrap rails, random lgth.	37.00 to	38.00
Rails 2 ft and under	43.00 to	44.00
RR. steel wheels	35.00 to	36.00
RR. spring steel	35.00 to	36.00
RR. couplers and knuckles	35.00 to	36.00
No. 1 machinery cast.	43.00 to	44.00
Cupola cast.	37.00 to	38.00
Heavy breakable cast.	31.00 to	32.00

Chicago

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	27.00 to	28.00
No. 1 factory bundles	30.00 to	32.00
No. 1 dealers' bundles	29.00 to	31.00
No. 2 dealers' bundles	21.00 to	23.00
Machine shop turn.	13.50 to	14.00
Mixed bor. and turn.	13.50 to	14.00
Shoveling turnings	15.50 to	16.00
Cast iron borings	15.50 to	16.00
Low phos. forge crops	36.00 to	38.00
Low phos. punch'gs, plate	33.00 to	34.00
Low phos. 2 ft and under	32.00 to	33.00
No. 1 RR. hvy. melting	31.00 to	33.00
Scrap rails, random lgth.	34.00 to	36.00
Rerolling rails	40.00 to	42.00
Rails 2 ft and under	43.00 to	44.50
Locomotive tires, cut	34.00 to	35.00
Cut bolsters & side frames	36.00 to	37.00
Angles and splice bars	37.00 to	38.00
RR. steel car axles	39.00 to	40.00
RR. couplers and knuckles	34.00 to	35.00
No. 1 machinery cast.	40.00 to	42.00
Cupola cast.	37.00 to	39.00
Heavy breakable cast.	31.00 to	32.00
Cast iron brake shoes	36.00 to	37.00
Cast iron car wheels	34.00 to	35.00
Malleable	40.00 to	42.00
Stove plate	31.00 to	33.00

Philadelphia Area

No. 1 hvy. melting	$22.00 to	$23.50
No. 2 hvy. melting	20.00 to	21.50
No. 1 bundles	23.00 to	24.50
No. 2 bundles	18.00 to	19.00
Machine shop turn.	12.00 to	13.00
Mixed bor. short turn.	9.00 to	10.00
Cast iron borings	9.00 to	10.00
Shoveling turnings	16.00 to	17.00
Clean cast chem. borings.	24.00 to	25.00
Low phos. 5 ft and under	27.00 to	28.00
Low phos. 2 ft and under	28.00 to	29.00
Low phos. punch'gs	28.00 to	29.00
Elec. furnace bundles	23.00 to	24.50
Heavy turnings	21.00 to	22.00
RR. steel wheels	29.00 to	30.00
RR. spring steel	29.00 to	30.00
Rails 18 in. and under	39.00 to	40.00
Cupola cast.	34.00 to	37.00
Heavy breakable cast.	35.50 to	36.50
Cast iron carwheels	38.00 to	39.00
Malleable	38.00 to	39.00
Unstripped motor blocks.	27.00 to	28.00
No. 1 machinery cast.	39.00 to	40.00
Charging box cast.	36.00 to	37.00

Cleveland

No. 1 hvy. melting	$27.00 to	$28.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 bundles	27.00 to	28.00
No. 2 bundles	21.00 to	22.00
No. 1 busheling	27.00 to	28.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	16.00 to	17.00
Shoveling turnings	16.00 to	17.00
Cast iron borings	16.00 to	17.00
Cut struct'r'l & plate, 2 ft & under	33.50 to	34.50
Drop forge flashings	27.00 to	28.00
Low phos. 2 ft & under	28.00 to	29.00
No. 1 RR. heavy melting	27.00 to	28.00
Rails 3 ft and under	44.00 to	45.00
Rails 18 in. and under	45.00 to	46.00
Railroad grate bars	27.00 to	28.00
Steel axle turnings	19.00 to	20.00
Railroad cast.	41.00 to	42.00
No. 1 machinery cast.	41.00 to	42.00
Stove plate	34.00 to	35.00
Malleable	40.00 to	41.00

Youngstown

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 bundles	29.00 to	30.00
No. 2 bundles	22.00 to	23.00
Machine shop turn.	14.00 to	15.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	19.00 to	20.00
Low phos. plate	31.00 to	32.00

Buffalo

No. 1 hvy. melting	$25.00 to	$26.00
No. 2 hvy. melting	19.50 to	20.50
No. 1 busheling	23.00 to	24.00
No. 1 bundles	25.00 to	26.00
No. 2 bundles	17.50 to	18.50
Machine shop turn.	14.00 to	14.50
Mixed bor. and turn.	16.50 to	17.00
Shoveling turnings	17.50 to	18.00
Cast iron borings	16.50 to	17.00
Low phos. plate	27.00 to	28.00
Scrap rails, random, lgth.	33.00 to	34.00
Rails 2 ft and under	40.00 to	41.00
RR. steel wheels	34.00 to	35.00
RR. spring steel	34.00 to	35.00
RR. couplers and knuckles	34.00 to	35.00
No. 1 machinery cast.	40.00 to	41.00
No. 1 cupola cast.	37.00 to	38.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$20.00 to	$21.00
No. 2 hvy. melting	19.00 to	20.00
No. 1 bundles, openhearth	23.00 to	24.00
No. 2 bundles	19.00 to	20.00
New busheling	21.00 to	22.00
Drop forge flashings	21.00 to	22.00
Machine shop turn.	9.00 to	10.00
Mixed bor. and turn.	11.00 to	12.00
Shoveling turnings	11.00 to	12.00
Cast iron borings	11.00 to	12.00
Low phos. punch's, plate	22.00 to	23.00
No. 1 cupola cast.		36.00
Heavy breakable cast.		26.00
Stove plate		30.00
Automotive cast.		40.00

St. Louis

No. 1 hvy. melting	$25.00 to	$26.00
No. 2 hvy. melting	23.50 to	24.50
No. 1 bundles	25.00 to	26.00
No. 2 bundles	19.50 to	20.50
Machine shop turn.	12.00 to	13.00
Cast iron borings	13.00 to	14.00
Shoveling turnings	13.00 to	14.00
No. 1 RR. hvy. melting	29.00 to	30.00
Rails, random lengths	37.00 to	38.00
Rails, 18 in. and under	40.00 to	41.00
Locomotive tires, uncut	29.00 to	30.00
Angles and splice bars	31.00 to	32.00
Std. steel car axles	35.00 to	36.00
RR. spring steel	32.50 to	33.50
Cupola cast.	42.00 to	43.00
Hvy. breakable cast.	27.00 to	28.00
Cast iron brake shoes	32.00 to	33.00
Stove plate	37.00 to	38.00
Cast iron car wheels	30.00 to	31.00
Malleable	34.00 to	35.00
Unstripped motors blocks	27.00 to	28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to	$18.00
No. 2 hvy. melting	15.00 to	16.00
No. 2 bundles	14.00 to	15.00
Machine shop turn.	5.00 to	6.00
Mixed bor. and turn.	7.00 to	8.00
Shoveling turnings	8.00 to	9.00
Clean cast chem. borings.	18.00 to	19.00
No. 1 machinery cast.	35.00 to	36.00
Mixed yard cast.	29.00 to	30.00
Charging box cast.	29.00 to	30.00
Heavy breakable cast.	29.00 to	30.00
Unstripped motor blocks.	22.00 to	23.00

Birmingham

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		20.00
No. 2 bundles	$15.00 to	16.00
No. 1 busheling		20.00
Machine shop turn.		13.00
Shoveling turnings		15.00
Cast iron borings	13.00 to	14.00
Electric furnace bundles	25.00 to	26.00
Bar crops and plate	28.00 to	29.00
Structural and plate, 2 ft	28.00 to	29.00
No. 1 RR. hvy. melting	26.00 to	27.00
Scrap rails, random lgth.	34.00 to	35.00
Rails, 18 in. and under	37.50 to	38.50
Angles & splice bars	36.00 to	37.00
Rerolling rails	34.00 to	35.00
No. 1 cupola cast.	42.00 to	43.00
Stove plate	39.00 to	40.00
Cast iron car wheels	33.00 to	34.00
Charging box cast.	19.00 to	20.00
Heavy breakable	24.00 to	25.00
Unstripped motor blocks.	31.00 to	32.00
Mashed tin cans	14.00 to	15.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to	$17.00
No. 2 hvy. melting	14.00 to	15.00
No. 1 bundles	16.00 to	17.00
No. 2 bundles	12.00 to	13.00
No. 1 busheling	16.00 to	17.00
Elec. furnace, 3 ft & under		17.00
Machine shop turn.	3.00 to	4.00
Mixed bor. and short turn.	5.00 to	6.00
Shoveling turnings	7.00 to	7.50
Clean cast chem. borings.	13.00 to	14.00
No. 1 machinery cast.	27.00 to	29.00
Mixed cupola cast.	26.00 to	27.00
Heavy breakable cast.	25.00 to	25.50
Stove plate	23.00 to	24.00
Unstripped motor blocks	7.00 to	8.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$25.00 to	$26.00
No. 2 hvy. melting	22.00 to	23.00
No. 1 bundles	25.00 to	26.00
No. 2 bundles	19.00 to	20.00
Machine shop turn.	11.00 to	12.00
Mixed bor. and turn.	13.50 to	14.50
Shoveling turnings	13.50 to	14.50
Cast iron borings	13.50 to	14.50
Low phos., 18 in. & under	33.00 to	34.00
Rails, random lengths	37.00 to	38.00
Rails, 18 in. and under	44.00 to	45.00
No. 1 cupola cast.	37.00 to	38.00
Hvy. breakable cast.	35.00 to	36.00
Drop broken cast.	45.00 to	46.00

San Francisco

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		16.00
No. 1 bundles		19.00
No. 2 bundles		16.00
No. 3 bundles		12.00
Machine shop turn.		5.00
Cast iron borings		9.00
No. 1 RR. hvy. melting		23.00
No. 1 cupola cast.	$39.00 to	42.50

Los Angeles

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		16.00
No. 1 bundles		17.00
No. 2 Bundles	$13.50 to	14.00
No. 3 bundles		12.00
Machine shop turn.		5.00
Shoveling turnings	$7.00 to	9.00
Cast iron borings	7.00 to	9.00
Elec. fur. 1 ft and under.		25.00
No. 1 RR. hvy. melting		20.00
No. 1 cupola cast.	38.00 to	40.00

Seattle

No. 1 hvy. melting		$23.00
No. 2 hvy. melting		19.00
No. 1 bundles		22.00
No. 2 bundles		16.00
No. 3 bundles		13.00
No. 1 cupola cast.		37.00
Mixed yard cast.		35.00

Hamilton, Ont.

No. 1 hvy. melting		$22.00
No. 2 hvy. melting		19.00
No. 1 bundles		22.00
No. 2 bundles		19.00
Mixed steel scrap		16.00
Bushelings		17.00
Bush., new fact prep'd.		20.00
Bush., new fact unprep'd.		16.00
Short steel turnings		12.00
Mixed bor. and turn.		12.00
Rails, remelting		31.00
Cast scrap	$42.00 to	45.00

You can't beat **Ohio Magnets** for

performance

Morning . . . noon . . . night—Ohio Magnets lift uniformly larger loads over extended periods because they operate *cooler.*

Take this husky Ohio Bolted Magnet, for instance. Heavy-duty strap-wound copper coils are protected by longer-lasting inorganic insulation carefully sealed with non-remelting or asphaltum compound.

For extra magnet performance, extra magnet value—specify Ohio Magnets. Remember, Ohio Magnets lift larger loads longer—*especially with Ohio Magnet Controllers.*
Send for Bulletin 112.
Offices in principal cities listed in Classified Directory.

OHIO WELDED MAGNETS. 39 to 65" diameter. Lightweight models in 39 & 45". 6-coil types in 46, 55, 65"; 8-coil in 55 & 65". Weld on top where it can't get dented in. Also capsule coil over 45".

OHIO BOLTED MAGNETS. 12 to 65" diameter. 6-coil types in 39 to 65"; 8-coil in 55 & 65". Strap copper coils over 39". Bolts protected in recessed wells. Also capsule coil over 45".

OHIO BASKET MAGNETS. 55 & 65" 4-coil, & 65" 6-coil. For extra heavy-duty service; hefty ears project beyond magnet diameter, ward off damaging blows. No weight carried by bolts. Also capsule coil over 45".

ohio ELECTRIC

CHESTER BLAND
President

THE OHIO ELECTRIC MFG. CO.
5400 DUNHAM RD. • CLEVELAND, OHIO

Ohio Also Makes Separation Magnets • Heavy-Duty Electric Hoists • Nail Making Machines • Fractional Horsepower, Shell and Torque Motors • Precision Threaded Parts for Aircraft Engine Manufacturers

A-7301

Comparison of Prices

(Effective May 11, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	May 11 1954	May 4 1954	Apr. 13 1954	May 12 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.513	5.513	5.513	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	39.75
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. terns	7.75	7.75	7.75	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.16¢	4.16¢	4.16¢	3.95¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	34.00
Wrought iron bars	10.40	10.40	10.40	10.05
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$4.075
Light rails	5.20	5.20	5.20	5.00
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$59.00
Slabs, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slab	82.00	82.00	82.00	76.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.390¢

	May 11 1954	May 4 1954	Apr. 13 1954	May 12 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$60.69
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago	56.50	56.50	56.50	55.00
Basic del'd, Philadelphia	60.27	60.27	60.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	9.85¢
‡ 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$55.26
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50	$29.50	$26.50	$39.50
No. 1 steel, Phila. area	22.75	22.75	21.50	40.50
No. 1 steel, Chicago	29.50	29.50	27.50	36.00
No. 1 bundles, Detroit	23.50	22.50	17.50	36.50
Low phos., Youngstown	31.50	31.50	31.50	47.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	41.50	49.50
No. 1 mach'y cast, Philadel'a.	39.50	39.50	39.50	47.50
No. 1 mach'y cast, Chicago	41.00	41.00	39.50	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$27.58	$27.25	$25.17	$36.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.75
Foundry coke, prompt	16.75	16.75	16.75	17.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	29.875‡
Copper, Lake, Conn.	30.00	30.00	30.00	....
Tin, Straits, New York	93.50†	93.50*	99.50	96.50
Zinc, East St. Louis	10.25	10.25	10.25	11.00
Lead, St. Louis	13.80	13.80	13.80	12.30
Aluminum, virgin ingot	21.50	21.50	21.50	20.50
Nickel, electrolytic	63.08	63.08	63.08	63.00
Magnesium, ingot	27.75	27.75	27.75	27.00
Antimony, Laredo, Tex.	28.50	28.50	28.50	34.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on p. 195 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.25	61.75	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct., $2 per ton for .05 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1*, *G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50-20 75	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.90	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50-46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75-59.00	45.75-46.00	51.25	30.00	30.50-31.00	30.50
Sheets	38.25-46.25	41.50-46.50	48.75	43.75-48.75	62.75-64.25	50.50-55.50	59.25-60.75	34.25-40.75	41.25	34.75-43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	53.25-55.00	41.00-42.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41 50	45.50	43.75	62.75-66.50	50.50-54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*, Detroit, *M2*; Canton-Massillon, O., *R5*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*.

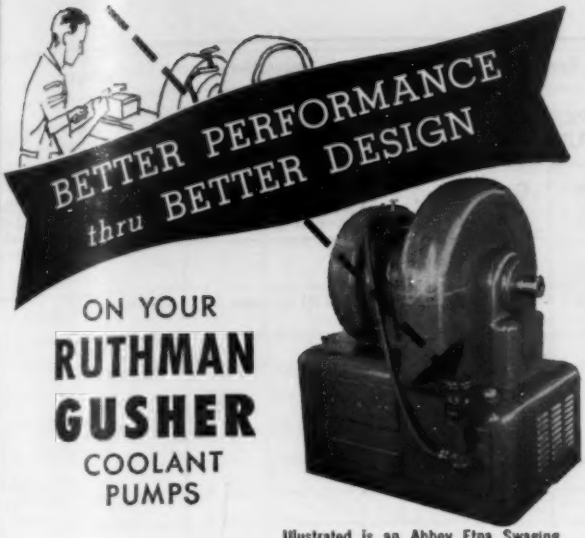
Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.



BETTER PERFORMANCE thru BETTER DESIGN

ON YOUR

RUTHMAN GUSHER

COOLANT PUMPS

Illustrated is an Abbey Etna Swaging Machine, Series #154, equipped with a Ruthman Gusher Coolant Pump

All Gusher Coolant Pumps are designed to give you better performance. You get split-second control of coolant flow from the instant the machine is turned on.

Pre-lubricated heavy-duty ball bearings require no further lubrication. There is no packing or priming necessary. The electronically balanced rotating assembly reduces vibration and lengthens the life of your Gusher Coolant Pump. Always specify Gusher Coolant Pumps. Write for catalog.

THE **RUTHMAN** MACHINERY CO.

1809-1823 READING ROAD — CINCINNATI 2, OHIO

Stonehouse **SIGNS** FOR INDUSTRIAL **ACCIDENT PREVENTION**

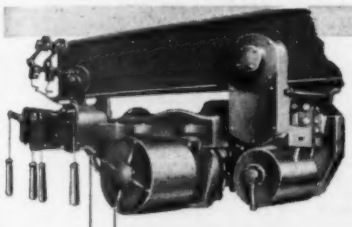
Safety on the March

Whatever your hazard, warning or guidance there's a Stonehouse sign to meet them. Shown in full color in our complete 64-page Catalog. It's sent free on request.

Stonehouse SIGNS, Inc. MANUFACTURERS • Stonehouse Bldg., 9th at Larimer, Denver 4, Colorado

"Signs Since 1863"

ACCIDENT PREVENTION • steel SIGNS IN STANDARD COLORS AND DESIGNS



move it overhead with

ELECTROLIFT

Materials will move faster and with less waste motion when you move them over crowded aisles with ElectroLift worm drive hoists. Any ElectroLift will quickly pay for itself in savings in time, power, labor and reduced accidents.

Built for long, profitable and trouble-free service, the ElectroLift hoist is available in a wide variety of models up to 6 tons capacity with optional pushbutton control.

Get all the facts on ElectroLift by contacting your ElectroLift representative listed in your telephone directory.

ElectroLift, Inc.

204 Sargeant Avenue, Clifton, N. J.

2178

WORM DRIVE ELECTROLIFT HOISTS

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can *perforate almost any size perforation in any kind of metal or material required.* Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

Write for New Catalog of Patterns

TIN, STEEL, COPPER, ALUMINUM, BRONZE, BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS

50 FAIRMOUNT AVE. — JERSEY CITY, N. J.

IRON AGE

STEEL PRICES

(Effective May 11, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$82.00 *B3*		4.15 *B3*	6.20 *B3*	4.15 *B3*						
	Buffalo, N. Y.	$62.00 *B3*	$75.50 *B3, R3*	$82.00 *B3, R3*	4.925 *B3*	4.15 *B3*	6.30 *B3*	4.15 *B3*	3.925 *B3, R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.05 *A2*		5.90 *A2*			
	New Bedford, Mass.									6.00 *R6*				
	Harrison, N. J.													12.00 *C11*
	Johnstown, Pa.	$62.00 *B3*	$75.50 *B3*	$82.00 *B3*		4.15 *B3*	6.20 *B3*							
	Fairless, Pa.													
	New Haven, Conn.									5.90 *D1* 6.20 *A5*				
	Phoenixville, Pa.					4.15 *P2*		4.15 *P2*						
	Sparrows Pt., Md.								3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Wallingford, Conn.									5.90 *W1*				
	Worcester, Mass.									6.30 *A5*				12.30 *A5* 12.45 *N7*
MIDDLE WEST	Alton, Ill.								4.10 *L1*					
	Ashland, Ky.								3.925 *A7*					
	Canton-Massillon, Dover, Ohio			$82.00 *R3, T5*										12.00 *G4*
	Chicago, Ill.	$62.00 *U1*	$75.50 *R3, U1,W8*	$82.00 *U1, W8,R3*	4.925 *U1*	4.10 *U1, W8*	6.175 *U1, Y1*	4.10 *U1*	3.925 *A1, W8*	5.70 *A1*	5.95 *R3*		6.40 *W8*	
	Cleveland, Ohio		$75.50 *R3*							5.45 *A5, J3*		7.80 *J3* 8.15 *A5*		12.00 *A5* 12.15 *N7*
	Detroit, Mich.			$84.00 *R5*					4.075 *G3* 4.15 *M2*	5.60 *D1,D2, G3,M2,P11*	6.10 *G3*	7.90 *D2* 8.30 *G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*	4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*		3.925 *I3, U1,Y1*	5.70 *I3*	5.95 *U1, I3* 6.45 *Y1*		6.40 *U1*	
	Granite City, Ill.													
	Indianapolis, Ind.									5.60 *C5*				
	Mansfield, Ohio													
	Middletown, Ohio									5.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								3.925 *S1*	5.45 *S1,T4*	5.95 *S1*	7.65 *S1*	6.40 *S1*	12.00 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$62.00 *U1, J3*	$75.50 *J3, U1*	$82.00 *U1, C11*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.10 *U1*	3.925 *A7,P6* 3.95 *S7* 4.425 *S9*	5.45 *B4,J3, S7*		7.80 *J3*	6.40 *S9* 6.45 *S7*	11.80 *S9* 12.15 *S7*
	Portsmouth, Ohio								3.925 *P7*					
	Weirton, Wheeling, Follansbee, W. Va.					4.10 *W3*			3.925 *W3*	5.45 *F3, W3*	5.95 *W3*	8.15 *W3*		
	Youngstown, Ohio			$82.00 *Y1, C10*		4.10 *Y1*	6.675 *Y1*		3.925 *R3, U1,Y1*	5.45 *R3,Y1, C5*	5.95 *U1, R3* 6.45 *Y1*	7.60 *R3* 8.30 *Y1*	6.40 *U1*	12.00 *C5*
WEST	Fontana, Cal.	$70.00 *K1*	$83.50 *K1*	$101.00 *K1*		4.75 *K1*	6.825 *K1*	5.10 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*		7.80 *K1*	13.65 *K1*
	Geneva, Utah		$75.50 *C7*			4.10 *C7*	6.175 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.775 *S2*		4.525 *S2*		6.55 *S2*		7.00 *S2*	
	Los Angeles, Torrance, Cal.		$85.00 *B2*	$102.00 *B2*		4.80 *B2, C7*	6.85 *B2*		4.675 *B2, C7*	7.50 *C1*			7.60 *B2*	
	Minnequa, Colo.					4.55 *C6*			5.025 *C6*					
	San Francisco, Niles, Pittsburg, Cal.		$85.00 *B2*			4.75 *B2* 4.91 *P9*	6.80 *B2*		4.675 *B2, C7*					
	Seattle, Wash.		$89.00 *B2*			4.85 *B2*	6.90 *B2*							
SOUTH	Atlanta, Ga.								4.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$62.00 *T2*	$75.50 *T2*			4.10 *R3, T2*	6.175 *T2*		3.925 *R3, T2,C16*		5.95 *T2*			
	Houston, Tex.		$83.50 *S2*	$90.00 *S2*		4.50 *S2*			4.325 *S2*				6.80 *S2*	

STEEL PRICES

(Effective May 11, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	3.975 *A2*					5.90 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.525 *B3*			
	Fairless, Pa.	3.975 *U1*	4.825 *U1*				5.95 *U1*	7.275 *U1*				$8.80 *U1*	$7.50 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*	
	Worcester, Mass.										4.825 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.70 *L1*			
	Ashland, Ky.	3.925 *A7*		5.275 *A7*	5.175 *A7*									
	Canton-Massillon, Dover, Ohio			5.275 *R1, R3*						5.05 *R1*				
	Chicago, Joliet, Ill.	3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4, R3*			
	Sterling, Ill.										4.625 *N4*			
	Cleveland, Ohio	3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3, R3*	7.225 *J3, R3*			4.525 *A5*			
	Detroit, Mich.	4.075 *G3, M2*	4.925 *G3*				6.05 *G3*	7.375 *G3*						
	Newport, Ky.	3.925 *N5*												
	Gary, Ind. Harbor, Indiana	3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1, I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*
	Granite City, Ill.	4.125 *G2*	4.975 *G2*	5.475 *G2*	5.375 *G2*								$7.69 *G2*	6.30 *G2*
	Kokomo, Ind.	4.025 *C9*		5.375 *C9*						5.025 *C9*	4.625 *C9*			
	Mansfield, Ohio					5.675 *E2*				5.05 *E2*				
	Middletown, Ohio		4.775 *A7*		5.175 *A7*	5.675 *A7*								
	Niles, Ohio Sharon, Pa.	3.925 *S1* 5.175 *N3*	5.80 *N3*	5.275 *N3*	6.525 *N3*	5.45 *S1* 5.675 *N3*	5.90 *S1*						$7.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	3.925 *J3, U1, P6, A7*	4.775 *J3, U1, P6*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1* 4
	Portsmouth, Ohio	3.925 *P7*	4.775 *P7*								4.525 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	3.925 *W3, W5*	4.775 *W3, W5, F3*	5.275 *W3, W5*		5.675 *W3, W5*	5.90 *W3*	7.225 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.10 *F3, W5*
	Youngstown, Ohio	3.925 *R3, U1, Y1*	4.775 *R3, Y1*		5.175 *Y1*		5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*		
WEST	Fontana, Cal.	4.70 *K1*	5.875 *K1*				6.675 *K1*	8.275 *K1*			5.325 *K1*			
	Geneva, Utah	4.025 *C7*												
	Kansas City, Mo.									4.775 *C6*	4.865 *S2*			
	Los Angeles, Torrance, Cal.	4.625 *C7*		6.275 *C7*							5.325 *B2*			
	Minnequa, Colo.										4.775 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.625 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2* 5.225 *R3*	4.525 *T2* *R3*	$8.80 *T2*	$7.50 *T2*	
	Houston, Texas	4.325 *S2*									4.925 *S2*			

† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box.

* COKES: 1.50-lb add 25¢.

ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢; 1.00-lb add $1.20.

UNIVERSITY OF MICHIGAN LIBRARIES

STEEL PRICES

(Effective May 11, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'n. Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.325 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3* 4.18 *R3*	4.15 *B3,R3*	5.25 *B5*	4.875 *B3,R3*	6.325 *B3,B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.							4.10 *C4*		5.55 *C4*		
	Coatesville, Pa.							4.10 *L4*		5.55 *L4*		
	Conshohocken, Pa.							4.10 *A2*	5.15 *A2*		6.25 *A2*	
	Harrisburg, Pa.							4.10 *C3*	5.15 *C3*			
	Hartford, Conn.			5.75 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Fairless, Pa.	4.30 *U1*	4.30 *U1*		5.025 *U1*							
	Newark, N. J.			5.65 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.65 *P10*		6.50 *P10*						
	Putnam, Conn.			5.75 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5* 6.10 *W11*		6.775 *B5*						5.825 *A5, W6*
	Readville, Mass.			5.75 *C14*								
MIDDLE WEST	Alton, Ill.	4.35 *L1*										5.70 *L1*
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio			5.20 *R2,R3*	4.875 *R3,T5*	6.325 *R2,R3, T5*						
	Chicago, Joliet, Ill.	4.15 *U1, N4,W8* 4.22 *R3*	4.15 *R3,N4*	5.20 *A5,W10, W8,B5,L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10,L2, R3,B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A1, R3,N4,W7*
	Cleveland, Ohio	4.21 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5, C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5,G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	4.975 *R5* 5.025 *G3*	6.425 *R5* 6.475 *P8* 6.525 *B5,P3*	6.375 *G3*	4.25 *G3*			6.40 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.							4.30 *G2*				
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.25 *N4*	4.25 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.55 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5, J3, W10,R3,C8*	4.875 *U1,C11*	6.325 *A5,C11, W10,C8*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5, J3,P6*
	Portsmouth, Ohio											5.525 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.15 *W3*						4.10 *W3*				
	Youngstown, Ohio	4.15 *U1,Y1* 4.20 *R3*	4.15 *R3, U1, Y1*	5.20 *Y1,F2*	4.875 *U1,Y1, C10*	6.325 *Y1, C10,F2*	6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Emeryville, Cal.	4.90 *J5*	4.90 *J5*									
	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.75 *S2*	4.75 *S2*		5.475 *S2*		6.825 *S2*					6.125 *S2*
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					6.475 *B2*
	Minnequa, Colo.	4.60 *C6*	4.75 *C6*					4.95 *C6*				5.775 *C6*
	Portland, Ore.	4.90 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2,N6*	4.90 *B2*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.35 *A8*	4.35 *A8*									5.725 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.15 *T2,C16* 4.18 *R3*	4.15 *R3,T2, C16*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.275 *S2*			4.50 *L3,S2*				5.925 *S2*

Steel Prices

(Effective May 11, 1954)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 †American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Temken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Fred Ulbrich & Sons, Wallingford, Conn.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	24.25	.....	27.25	.....	29.75	.....	32.25	.....	32.75	.....	33.25	.....	34.75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	16.75	.....	20.75	.....	22.75	.....	23.25	.....	23.75	.....	24.25	.....	24.75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1c. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 10.25¢.

UNIVERSITY OF MICHIGAN LIBRARIES

Steel Prices

(Effective May 11, 1954)

To identify producers, see Key on preceding page

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.325	5.20	5.275				
So. Chicago *R3*				7.05			
Cleveland *R3*							
Ensley *T2*	4.325	5.20					
Fairfield *T2*		5.20		7.05		5.125	
Gary *U1*	4.325	5.20				5.125	
Ind. Harbor *I3*	4.325		5.275	7.05		5.125	
Johnstown *B3*		5.20					
Joliet *U1*		5.20	5.275				
Kansas City *S2*				7.30			11.00
Lackawanna *B3*	4.325	5.20	5.275			5.125	
Lebanon *B3*				7.05	10.50		11.00
Minnequa *C6*	4.325	5.70	5.275	7.05		5.125	11.00
Pittsburgh *O1*					10.50		11.00
Pittsburgh *P5*					10.50		11.00
Pittsburgh *J3*				7.05			
Pitt'g, Cal. *C7*						5.275	
Seattle *B7*				7.55		5.275	11.50
Steelton *B3*	4.325		5.275			5.125	
Struthers *Y1*							
Torrance *C7*						5.275	
Youngstown *R3*				7.05			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		8.05	
Armature	8.15	8.40	8.90
Elect.	8.75	9.00	9.50
Motor	9.75	10.00	10.50
Dynamo	10.65	10.90	11.40
Trans. 72	11.60	11.85	12.35
Trans. 65	12.15	Grain Oriented	
Trans. 58	12.65	Trans. 80	16.25
Trans. 52	13.65	Trans. 73	16.75

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*32.7	
Washington, Pa., *J2*	....	
Claymont, Del., *C4*	....	
New Castle, Ind., *I2*	....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	37.5	
Inconel-carbon		
10 pct., Coatesville, Pa., *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	38.90	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	17½° Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annl'd ¢/lb.	Merch. Wire* Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	131	140		149	153	6.675	7.075
Aliquippa, Pa. *J3*	131	143			150	6.675	7.20
Atlanta *A8*	133	145		151	158	6.775	7.30
Bartonville *K2*	133	144			157	6.775	7.225
Buffalo *W6*							
Chicago, Ill. *N4*	131	143		149	156	6.675	7.20
Cleveland *A6*	137						
Cleveland *A5*						6.675	
Crawfordsville *M4*	133	145		151	153	6.775	7.325
Donora, Pa. *A5*	131	140		149	153	6.675	7.075
Duluth *A5*	131	140	145	149	153	6.675	7.075
Fairfield, Ala. *T2*	131	140		149	153	6.675	7.075
Galveston *D4*	139	148					
Houston *S2*	139	148			161	7.075	7.475
Johnstown, Pa. *B3*	131	143	145		156	6.675	7.225
Joliet, Ill. *A5*	131	140		149	153	6.675	7.075
Kokomo, Ind. *C9*	133	142		151	155	6.775	7.175
Los Angeles *B2*						7.625	
Kansas City *S2*	143	152		161	165	7.275	7.675
Minnequa *C6*	136	148	150	154	162	6.925	7.325
Monessen *P6*	131	145			157	6.675	7.225
Moline, Ill. *R3*			145				
Pittsburgh, Cal. *C7*	150	163		173	173	7.625	8.025
Portsmouth *P7*						6.675	
Rankin, Pa. *A5*	131	140			153	6.675	7.075
So. Chicago *R3*	131	140	145	149	153	6.675	7.075
S. San Francisco *C6*					173		
Sparrows Pt. *B3*	133			151	158	6.775	7.225
Struthers, O. *Y1*						6.675	7.175
Worcester *A5*	137					6.975	
Williamsport, Pa. *S10*	133		158				

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa. (*A7*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	5.75	7.65	8.60	10.55	12.85
Carnegie, Pa. *S9*		7.65	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D1*	5.65	7.85	8.80	10.55	
Detroit *D2*	5.60	7.85	8.80		
Harrison, N. J. *C11*			8.90	10.85	13.15
Indianapolis *C5*	5.60	7.80	8.60	10.55	
New Castle, Pa. *B4*	5.80	8.00	8.60		
New Haven, Conn. *D1*	5.90	7.95	8.90	10.85	
Riverdale, Ill. *A1*	5.70	7.80	8.75	10.70	13.00
Buffalo, N. Y. *R7*	5.45	7.65	8.60	10.55	12.85
Sharon, Pa. *S1*	5.45	7.65	8.60	10.55	12.85
Trenton *R4*		7.95	8.90	10.85	13.15
Wallingford *W1*	6.20	7.95	8.90	10.85	13.15
Warren, Ohio *T4*	5.45	7.65	8.60	10.55	12.85
Weirton, W. Va. *W3*	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. *A5*	6.30	7.95	8.90	10.85	13.15
Youngstown *C5*	5.45	7.65	8.60	10.55	

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	27.34	32.98	26.51	31.98
	2½	12	36.82	44.41	35.70	43.07
	3	12	42.52	51.28	41.23	49.72
	3½	11	49.63	59.87	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National Tube	2	13		32.98	26.51	
	2½	12	36.82	44.41	35.70	
	3	12	42.52	51.28	41.23	
	3½	11	49.63	59.87	48.13	
	4	10	65.91	79.50	63.92	
Pittsburgh Steel	2	13	27.34	32.98		
	2½	12	36.82	44.41		
	3	12	42.52	51.28		
	3½	11	49.63	59.87		
	4	10	65.91	79.50		

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A-4615 As rolled	Alloy Bars: Hot-Rolled A-4140 Annealed	Alloy Bars: Cold-Drawn A-4615 As rolled	Alloy Bars: Cold-Drawn A-4140 Annealed
Baltimore	$.20	6.20	7.12–7.64	7.36–7.78	7.00	.....	6.85	6.98	6.86	8.17	.....	.....	.....	.....
Birmingham	.15	6.10	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.90	.....	.....	.....	.....
Boston	.20	6.89	7.83–8.38	9.18	7.13	9.35[2]	7.13	7.06	6.87	8.35	12.40	11.94–12.28	14.65	14.55–14.58
Buffalo	.20	6.18–6.20	7.15	8.70	6.65–6.79	.....	6.65–6.68	6.55–6.59	6.35	7.70	.....	11.95–12.15	14.45	14.25–14.55
Chicago	.20	6.18	7.12	8.00	6.42	.....	6.33	6.46	6.28	7.30	.....	11.60	.....	14.05
Cincinnati	.20	6.30	7.11	.....	6.66	.....	6.62	6.93	6.52	7.60	.....	11.85	.....	14.30
Cleveland	.20	6.18	7.12	7.90–8.25	6.58	.....	6.50	6.79	6.34	7.40	12.04	11.74	14.29	14.19
Denver		7.95	8.85	10.45–10.47	8.20	9.55	7.95	7.95	8.05	9.05	.....	.....	.....	15.75
Detroit	.20	6.35–6.45	7.29–7.31	8.42	6.69–7.71	7.36	6.80	6.91–6.93	6.56	7.60	12.47	11.92	14.42	13.44–14.62
Houston	.20	7.15	7.45–7.60	9.23	7.45	.....	7.20	7.35	7.45	9.30–9.40	.....	12.80	.....	.....
Kansas City	.20	6.85	.....	.....	7.09	.....	7.00	7.13	6.95	8.07	.....	.....	.....	.....
Los Angeles	.20	7.25	9.00	9.75	7.55	.....	7.20	7.35	7.15	9.10–9.75	.....	12.90	.....	15.90
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	7.89–8.76	.....	.....	.....	.....
Milwaukee	.20	6.35	7.29	8.17	6.59	.....	6.50	6.63	6.45	7.57	.....	11.77	.....	14.22
New Orleans	.15	6.51	7.41	.....	6.63	.....	6.73	6.81	6.60	8.37	.....	.....	.....	.....
New York	.30	6.78	7.75–8.37	8.41[7]–8.42	7.16	9.15[5]	6.99	6.90	7.06	8.43	12.29	11.99	14.54	14.44
Norfolk	.20	6.90	.....	.....	7.00	.....	7.00	7.00	7.00	8.50	.....	.....	.....	.....
Philadelphia	.25	6.35–6.53	7.13	7.87	7.02	.....	6.63	6.67	6.87	8.19	.....	11.74	.....	14.19
Pittsburgh	.20	6.18	7.12	8.30	6.55	.....	6.33	6.46	6.28	7.65	.....	11.60	.....	14.05
Portland	.10	7.90–8.75	8.45–9.75	9.05–9.15	7.65	.....	7.30	7.25	7.35	10.65	.....	.....	.....	.....
Salt Lake City	.20	8.60	10.50	10.50[3]	9.25	.....	8.10	8.25	9.20	11.25	.....	.....	.....	.....
San Francisco	.20	7.35	8.70	9.15	7.60	.....	7.20	7.25	7.15	9.75	.....	12.90	.....	15.90
Seattle	.20	7.95–8.15	9.30–9.50	9.80	7.80–8.00	.....	7.40–7.60	7.30–7.50	7.40–7.60	10.45–10.65	.....	13.15	.....	15.60
St. Louis	.20	6.48	7.42	8.25–8.30	6.72	7.70–8.53	6.73	6.86	6.58	7.70	12.20	11.90	14.45	14.30–14.35
St. Paul	.15	6.84	7.78–8.33	8.66	7.08	13.22	6.99	7.12	6.94	8.06	.....	12.42	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb. (4)500 to 9999 lb. (5)1000 lb or over. (6)400 to 1499 lb. (7)1500 to 3499 lb. (8)2000 to 5999 lb.

Miscellaneous Prices

(Effective May 11, 1954)

TOOL STEEL

F.o.b. Mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.48
18	4	1	—	5	2.16
18	4	2	—	—	1.64
18	4	1.5	8	—	.895
1.5	4	2	6	—	1.005
6	4				.70

High-carbon chromium ..... .70
Oil hardened manganese ..... .39
Special carbon ..... .355
Extra carbon ..... .30
Regular carbon ..... .25

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $111.80 to $115.30
6 to 24-in., del'd N. Y... 115.00 to 116.00
6 to 24-in., Birmingham 98.00 to 102.50

4-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less ..... $129.50 to $131.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

Gross Ton

Openhearth lump $11.15
Old range, bessemer 10.30
Old range, nonbessemer 10.15
Mesabi, bessemer 10.05
Mesabi, nonbessemer 9.90
High phosphorus 9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.42
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed

GRAPHITE			CARBON		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	20.50	40	100, 110	8.95
20	72	20.00	35	110	8.95
12 to 18	72	20.50	30	110	8.95
7 to 10	60	21.00	24	72 to 84	9.10
6	60	23.25	20	90	8.95
4	40	26.00	17	72	9.10
3	40	27.25	14	72	9.50
2½	30	28.00	10, 12	60	10.30
2	24	43.50	8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg Reg.	K. Reg.	Less Keg Hvy.	K. Hvy.
½ in. & smaller	+2	15	+2	18
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	18	+20	net
¾ in. to 1½ in. inclusive	+6	12	+25	+4
1⅝ in. & larger	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	9
1⅝ in. & larger	+16	3	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	23	+8	10
1⅝ in. & larger	+14	5	+20	net

	Light	
7/16 in. & smaller	33	43
½ in. thru ⅝ in.	26	37
¾ in. to 1½ in. inclusive	18	30

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $3.90

Pct Off List

7/16 in. and smaller 30

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
¾ in. thru 1 in. up to & including 6 in. 36
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
¾ in. thru 1 in. up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes ... 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in...	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	23
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) .. $109.00
No. 1 Ohio 102.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 102.00
No. 2 Ohio 93.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 16.00

Silica Brick

Mt. Union, Pa., Ensley, Ala $115.00
Childs, Hays, Pa. 120.00
Chicago District 125.00
Western Utah 131.00
California 138.00
Super Duty Hays, Pa., Athens, Tex., Windham 132.00
Curtner, Calif. 150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 19.00
Silica cement, net ton, bulk, Hays, Pa. 21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala. 20.00
Silica cement, net ton, bulk, Utah and Calif. 28.50

Chrome Brick *Per net ton*

Standard chemically bonded Balt.. $86.00
Standard chemically bonded, Curtner, Calif. 96.25
Burned, Balt. 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 38.00
in sacks 43.75

Dead Burned Dolomite *Per net ton*

F.o.b., bulk, producing points in:
Pa., W. Va., Ohio $14.50
Midwest 14.60
Missouri Valley 13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content

72½% $44.00
70% or more 42.50
60% or less 38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags ... 11.25¢
Canadian sponge iron, del'd. in East ..... 13.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 18.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe.. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe.. 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots ..... 29.50¢ to 36.50¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quality, del'd... $3.60
Lead ..... 21.00¢
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 89.50¢
Nickel, annealed ..... 96.50¢
Nickel, spherical, unannealed 93.50¢
Silicon ..... 43.50¢
Solder powder .. 7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 91.0¢
Stainless steel, 316 ..... $1.10
Tin ..... 14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $4.65
Zinc, 10 ton lots ..... 17.5¢ to 25.0¢

UNIVERSITY OF MICHIGAN LIBRARIES

Ferroalloy Prices

(Effective May 11, 1954)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.

65-72 Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75

65-69% Cr, 4.9% C 24.75

62-66% Cr, 4.6% C, 6-9% Si 25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads 25.85
Ton lots 28.00
Less ton lots 29.50

High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.18
0.50% max. C 1.14
9 to 11% C 1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 19.00
Ton lots 22.10
Less ton lots 23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 20.00
Ton lots 22.30
Less ton lots 23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 17.50
Less ton lots 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 16.60
Ton lots 18.10
Less ton lots 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 17.50
Ton lots to carload packed 18.50
Less ton lots 20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 75 pct Mn:

Producing Point	Cents per lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.00
Clairton, Pa.	10.00
Sheridan, Pa.	10.00

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 12.50
Ton lots, packed 14.05

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 30.00
Ton lots 32.00
250 to 1999 lb 34.00
Less than 250 lb 37.00
Premium for hydrogen-removed metal 1.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.65
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk 11.00
Ton lots 12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet 12.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton Lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	13.80
50% Si	10.80	85% Si	15.55
65% Si	12.20	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) .. 3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 9.25¢
Ton lots 10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots $3.50
Less ton lots 3.55

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.21

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00

10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagra Falls, N. Y., and Bridgeville, Pa., freight, allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50

Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W. ton lots, f.o.b. $1.80

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14

bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound Contained V_2O_5 ..... $1.31

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots ..... $1.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... $1.30

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ..... $1.00
No. 6 ..... 63¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max C, 3.00% max. Fe, balance Ni, delivered

Less ton lots $2.05

Silcaz, contract basis, delivered

Ton lots ..... 45.00¢